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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

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MEMORANDUM

Subject: Ecological Risk Assessment for the proposed new use of Tetraconazole on Small Fruit Vine Climbing Subgroup 13-07F (except fuzzy kiwifruit), Low Growing Berry Subgroup 13-07G, and Corn.

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1. Executive Summary

Tetraconazole (\pm 1-[2-(2,4-dichlorophenyl)-3-(1,1,2,2-tetrafluoroethoxy)-propyl]-1H-[1,2,4]triazole, CAS 112281-77-3) is a broad spectrum systemic fungicide with protective, curative, and eradication properties. Tetraconazole is categorized as a triazole systemic fungicide, which act primarily by interfering with cell growth, particularly the ability to build cell walls, through inhibition of ergosterol biosynthesis in cell membranes. Tetraconazole is the active ingredient in the products MettleTM 125 ME Fungicide (EPA Reg. No. 80289-8) and Domark[®] 230 ME Fungicide (EPA Reg. No. 80289-7) which are formulated as liquid products for application by ground and aerial methods. The purpose of this ecological risk assessment is to identify potential risk associated with the proposed new use of tetraconazole on Small Fruit Vine Climbing Subgroup 13-07F (except fuzzy kiwifruit), Low Growing Berry Subgroup 13-07G (D381443), and Corn (D381446).



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A number of risk assessments have been conducted on tetaconazole. Previous assessments identified potential acute and chronic risks to birds and mammals (D350213, July 1, 2008). Similarly, potential acute and chronic risks to birds and mammals are identified for the proposed applications of tetaconazole to the small fruit vine climbing subgroup, low growing berry subgroup, and corn. In addition, it is likely that the potential for chronic risk to birds, mammals, and aquatic organisms may increase due to the fact that tetaconazole is persistent in the environment.

2. Use Characterization

The proposed uses of tetaconazole are for the control of powdery mildew, black rot, and anthracnose in fruit; powdery mildew, leaf spot, and leaf blight in low growing berries; ray leaf spot, common rust, southern rust, anthracnose leaf blight, eye spot, northern corn leaf blight, northern corn leaf spot, physoderma brown spot, southern corn leaf blight, and yellow leaf blight in corn. The maximum single application rate for the small fruit vine climbing subgroup is 0.04 lb a.i./A, applied 14 days apart, twice per season. The maximum annual application rate is no more than 0.08 lb a.i./A (Mettle™ 125 ME label). It is recommended that application of tetaconazole begin at 1- to 3- inches of new shoot growth to control black rot and anthracnose diseases in grapes. Also, tetaconazole application should begin at pre-bloom stage for the control of powdery mildew and when the first leaf unfolds for anthracnose disease control for fruits other than grapes.

According to the label, the maximum single application rate for low growing berries is 0.04 lbs a.i./A with a minimum interval of 14 days between applications and four applications per season. The maximum application rate per season is 0.16 lb a.i./A (Mettle™ 125 ME label). The label suggests applying Mettle™ 125 ME when conditions are favorable for powdery mildew, leaf spot and leaf blight development to control these diseases in low growing berries.

Tetaconazole can be applied to corn at a maximum single application rate of 0.09 lbs a.i./A and the maximum annual application rate should not exceed 0.09 lbs a.i./A. If two applications of 0.045 lbs a.i./A are applied within a year, then the minimum application interval is 7 days. The Domark® 230 ME label advises application of tetaconazole prior to the onset and development of ray leaf spot, common rust, southern rust, anthracnose leaf blight, eye spot, northern corn leaf blight, northern corn leaf spot, physoderma brown spot, southern corn leaf blight, and yellow leaf blight diseases in corn.

Table 1 lists the proposed application rates for fruit, low growing berries, and corn. Tetaconazole can be applied to fruit and berries by aerial, ground, or airblast application in addition to chemigation according to the Mettle™ 125 ME label. The fungicide can be applied to corn by aerial or ground application in addition to chemigation according to Domark® 230 ME label.

3. Exposure Summary

Tetaconazole is persistent in the environment and does not have a single predominant route of dissipation. Based on the field and laboratory studies, tetaconazole is expected to have low

volatility from soil and water surfaces and possesses slight mobility in soils. Successive applications are expected to result in year-to-year soil accumulation. Tetraconazole is likely to reach surface waters via spray drift and runoff but its tendency to reach ground water is expected to be attenuated due to its lack of mobility in soil. The chemical has low potential to reach groundwater, except in soils of high sand and low organic matter content. Detailed description of fate and transport properties of tetraconazole can be obtained from the July 1, 2008 comprehensive ecological risk assessment (D350213).

Table 1. Tetraconazole Maximum Application Rates for Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit), Low Growing Berry Subgroup, and Corn

Crop	Single Maximum Application Rate (lb a.i./A)	Maximum Number of Applications	Minimum Application Interval (days)	Maximum Annual Application Rate (lb a.i./A/season)
Small fruit vine climbing subgroup ^a : grape, gooseberry, Amur river grape, kiwifruit (hardy), maypop, Schisandra berry, cultivars, varieties, and/or hybrids of these	0.04	2	14	0.08
Low growing berry subgroup ^a : strawberry, blueberry (lowbush), bearberry, bilberry, cloudberry, cranberry, lingonberry, muntrees, partridge berry, cultivars, varieties, and/or hybrids of these	0.04	4	14	0.16
Corn ^b (field and pop)	0.09 0.045	1 2	N/A 7	0.09 0.09

^a Data obtained from the label for Mettle™ 125 ME
^b Data obtained from the label for Domark 230 ME. For terrestrial modeling, only a single application at 0.09 lb a.i./A was selected because this rate would produce the most conservative EECs. For aquatic modeling, two applications at 0.045 lb a.i./A was also selected, along with one application at 0.09 lb a.i./A, because of the short application interval and the stability of tetraconazole in the environment.

3.1. Aquatic Exposures

The PRZM/EXAMS input parameters for tetraconazole are shown in **Table 2**. Results of the PRZM/EXAMS modeling exercises are captured in **Tables 3 and 4**. Only aerial EECs are included in **Table 3** for surface water as they provide higher exposure estimates than ground, airblast, or chemigation EECs. Additionally, only the EECs from NY Grapes, FL Strawberry, and KS Corn crop scenarios were included in **Table 3** because they yield the most conservative EECs for the Small Fruit Vine Climbing Subgroup (NY Grapes), Low Growing Berry Subgroup (FL Strawberry), and Corn (KS Corn). Benthic pore water EECs were only calculated for the scenarios that produced the lowest and highest surface water EECs, CA Grapes and FL Strawberry respectively. Chemigation application to CA Grapes produced the lowest EECs for all crop scenarios while aerial application to FL Strawberry produced the highest EECs for all crop scenarios. A representative PRZM/EXAM model input and output data for FL Strawberry (aerial application) is attached in **Appendix A**.

Table 2. PRZM/EXAMS Input Parameters for Tetraconazole

Input Parameter:	Value:	Comment:	Source:
Scenario(s):	<u>Small Fruit Vine Climbing Subgroup 13-07 F:</u> CA Grapes, NY Grapes <u>Low Growing Berry Subgroup 13-07G:</u> CA Strawberry, FL Strawberry, OR Berry <u>Corn:</u> PA Corn, MS Corn, IL Corn, KS Corn, NC Corn	representative scenarios for each use	N/A
Maximum Single Application Rate lbs a.i./acre (kg a.i./ha)	<u>Small Fruit Vine Climbing Subgroup 13-07 F:</u> 0.04 (0.045) <u>Low Growing Berry Subgroup 13-07G:</u> 0.04 (0.045) <u>Corn:</u> 0.090 (0.101) 1 application 0.045 (0.051) 2 applications	proposed rates	proposed label
Applications per Year	Small Fruit Vine Climbing Subgroup 13-07 F: 2 Low Growing Berry Subgroup 13-07G: 4 Corn: 1, 2	label directions. Label specifies rates per season. If crops are rotated with those on which tetraconazole is used, yearly rates may be higher.	proposed label
Application Interval (days)	Small Fruit Vine Climbing Subgroup 13-07 F: 14 Low Growing Berry Subgroup 13-07G: 14 Corn: 7 (2 applications)	proposed application intervals	proposed label
Date of Initial Application (scenario/day/month)	<u>Small Fruit Vine Climbing Subgroup 13-07 F:</u> CA Grapes: 03-08 NY Grapes: 17-09 <u>Low Growing Berry Subgroup 13-07G:</u> CA Strawberry: 20-05 FL Strawberry: 04-01 OR Berry: 18-06 <u>Corn:</u> PA Corn: 08-07 (1 app.) and 01-07 (2 app.) MS Corn: 02-07 (1 app.) and 25-06 (2 app.) IL Corn: 23-07 (1 app.) and 16-07 (2 app.) KS Corn: 01-08 (1 app.) and 25-07 (2 app.) NC Corn: 07-07 (1 app.) and 30-06 (2 app.)	Date of initial application was calculated from the Pre-Harvest Interval (PHI) and application interval as written on the proposed labels. ¹ For corn, 90 days after emergence was selected to define corn growth stage R3 (brown silk/milk).	Crop Scenarios

Table 2. PRZM/EXAMS Input Parameters for Tetraconazole

Input Parameter:	Value:	Comment:	Source:
Application Method	<u>Small Fruit Vine Climbing Subgroup 13-07 F:</u> Foliar: aerial and ground Airblast Chemigation <u>Low Growing Berry Subgroup 13-07G:</u> Foliar: aerial and ground Airblast Chemigation <u>Corn:</u> Foliar: aerial and ground Chemigation	label directions	proposed label
CAM Input	2	linear foliar based on crop canopy	proposed label
Incorporation Depth (cm.)	N/A	--	proposed label
IPSCND Input	3 (berries) 1 (corn)	3 = remaining pesticide on foliage is retained as surface residue and continues to undergo decay. 1 = remaining pesticide on foliage is converted to surface application to the top soil layer	US EPA, 2005
Spray Drift Fraction	0.05 (aerial) 0.01 (ground) 0.03 (airblast) 0 (chemigation)	See footnote 2 for chemigation reference	Input parameter guidance (USEPA, 2009)
Application Efficiency	0.95 (aerial) 0.99 (ground) 0.99 (airblast) 1.0 (chemigation)	--	Input parameter guidance (USEPA, 2009)
Molecular Mass (g/mol)	372.1	--	Tomlin, 2003
Vapor Pressure at 25°C (torr)	9.901×10^{-7}	--	MRID 45851801
Henry's Law Constant (atm-m ³ /mol)	3.5×10^{-9}	--	Tomlin, 2003
Solubility in Water (mg/L)	156	pH 7 at 20°C	Tomlin, 2003
Organic Carbon Partition Coefficient (K _{OC}) (L/kg _{OC})	4424	³ represents the average K _{OC} from 5 values	MRID 47023201
Aerobic Soil Metabolism Half-life (days)	0 (stable)	--	MRID 44367005
Aerobic Aquatic Metabolism Half-life (days)	0 (stable)	represents the 90 th %-ile confidence bound on the mean half-life using half-lives of 382 and 320 days.	MRID 44751319

Table 2. PRZM/EXAMS Input Parameters for Tetraconazole

Input Parameter:	Value:	Comment:	Source:
Anaerobic Aquatic Metabolism Half-life (days)	0 (stable)	--	MRID 45840001
Hydrolysis Half-lives (days)	0 (stable)	pH 7	MRID 44367002
Aqueous Photolysis Half-life (days)	215	--	MRID 44367003

N/A = Not Applicable
¹ = http://www.dekalb-asia.com/pdf/CG5_DifferentStages.pdf
² = Chemigation (< 1% spray drift as described in http://www.agdrift.com/PDF_FILES/Chem.pdf - modeled as 0%)
³ = The reviewer-calculated coefficients of determination (R^2) for the relationships Kads vs. organic matter = 0.94; therefore, the average K_{oc} obtained from five values (11491, 2896, 5841, 670, and 1220) was used for this parameter.

Table 3. Tetraconazole Estimated Environmental Concentrations (EECs) for Surface Water based on selected Crop Scenarios

Proposed Label Use	PRZM/EXAMS Scenario (first app date)	Method¹	Application Rate (interval between applications)	Peak EEC (µg/L)	21-day EEC (µg/L)	60-day EEC (µg/L)
Surface Water						
Mettle™ 125 ME Fungicide						
Small Fruit Vine Climbing subgroup 13-07F (except fuzzy kiwifruit)	NY Grapes (September 17 - foliar)	A	2 app @ 0.04 lb a.i./acre (14-day interval)	5.16	5.08	4.98
Low Growing Berry subgroup 13-07G	FL Strawberry (January 04 - foliar)	A	4 app @ 0.04 lb a.i./acre (14-day interval)	16.45	16.09	15.89
Domark® 230 ME Fungicide						
Corn (field corn and popcorn including field corn grown for seed)	KS Corn (July 25 - foliar)	A	2 app @ 0.045 lb a.i./acre (7-day interval)	10.56	10.48	10.44
	KS Corn (August 01 - foliar)		1 app @ 0.09 lb a.i./acre	10.46	10.36	10.30

1. A = aerial application

Table 4. Tetraconazole Benthic Estimated Environmental Concentrations (EECs)¹ for Pore Water						
Proposed Label Use	PRZM/EXAMS Scenario¹ (first app date)	Method²	Application Rate (interval between applications)	Peak EEC (µg/L)	21-day EEC (µg/L)	60-day EEC (µg/L)
Benthic Pore Water						
Mettle™ 125 ME Fungicide						
Low Growing Berry subgroup 13-07G	FL Strawberry (January 04 - foliar)	A	4 app @ 0.04 lb a.i./acre (14-day interval)	15.13	15.13	15.11
Small Fruit Vine Climbing subgroup 13-07F (except fuzzy kiwifruit)	CA Grapes (August 3 – chemigation)	C	2 app @ 0.04 lb a.i./acre (14-day interval)	0.41	0.41	0.41

¹ Benthic Pore Water concentrations were estimated for the scenarios that produced the highest and lowest EEC values for surface water. These values are used to bracket risk quotient values.

² A = aerial application, C = chemigation

3.2. Terrestrial Exposures

T-REX 1.4.1 was used to estimate potential exposures to birds and mammals. Maximum application rates from **Table 1** were used as input data in T-REX models. A default 35-day foliar dissipation half-life value was used. The predicted maximum residues of tetraconazole that may be expected to occur on selected avian and mammalian food items immediately following application to fruit, corn, and berries is presented in **Table 5**. The EEC equivalent doses for birds and mammals are given in **Tables 6 and 7**, respectively.

Table 5. Dietary-Based Terrestrial EECs (ppm) Estimated Using Kenaga Values for Tetraconazole Applied to Small Fruit Vine Climbing Subgroup, Corn, and Low Growing Berry Subgroup

Forage Type	EEC (ppm)¹		
	Small Fruit Vine Climbing Subgroup	Corn	Low Growing Berry Subgroup
Short grass	16.88 (5.98)	21.60 (7.65)	26.57 (9.41)
Tall Grass	7.73 (2.53)	9.90 (3.24)	12.18 (3.99)
Broadleaf plants and small insects	9.49 (3.16)	12.15 (4.05)	14.94 (4.98)
Fruits/pods/large insects	1.05 (0.49)	1.35 (0.63)	1.66 (0.77)

¹ Upper bound residues do not have parenthesis and mean residues are captured by parenthesis

Table 6. Dose-Based Avian EECs (mg/kg BW) for Tetraconazole Applied to Fruit, Corn, and Berries

Forage Type	Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit)			Corn			Low Growing Berry Subgroup		
	Small (20 g)	Mid-Sized (100 g)	Large (1000 g)	Small (20 g)	Mid-Sized (100 g)	Large (1000 g)	Small (20 g)	Mid-Sized (100 g)	Large (1000 g)
Short Grass	19.22	10.96	4.91	24.60	14.03	6.28	30.26	17.25	7.73
Tall Grass	8.81	5.02	2.25	11.28	6.43	2.88	13.87	7.91	3.54
Broadleaf plants/ small insects	10.81	6.16	2.76	13.84	7.89	3.53	17.02	9.71	4.35
Fruits/pods/ large insects	1.20	0.68	0.31	1.54	0.88	0.39	1.89	1.08	0.48

Table 7. Dose-Based Mammalian EECs (mg/kg BW) for Tetraconazole Applied to Fruit, Corn, and Berries

Forage Type	Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit)			Corn			Low Growing Berry Subgroup		
	Small (15 g)	Mid-Sized (35 g)	Large (1000 g)	Small (15 g)	Mid-Sized (35 g)	Large (1000 g)	Small (15 g)	Mid-Sized (35 g)	Large (1000 g)
Herbivores									
Short Grass	16.09	11.12	2.58	20.59	14.23	3.30	25.33	17.51	4.06
Tall Grass	7.37	5.10	1.18	9.44	6.52	1.51	11.61	8.02	1.86
Broadleaf plants/small insects	9.05	6.25	1.45	11.58	8.01	1.86	14.25	9.85	2.28
Fruits/pods/ large insects	1.01	0.69	0.16	1.29	0.89	0.21	1.58	1.09	0.25
Granivores									
Seeds	0.22	0.15	0.04	0.29	0.20	0.05	0.35	0.24	0.06

TERRPLANT 1.2.2 was used to estimate exposures and risks to terrestrial plant species. Input values used for estimating terrestrial and semi-aquatic plant exposure risks to tetraconazole are summarized in **Table 8**. EECs are estimated for total loading to terrestrial areas of concern, total loading to semi-aquatic areas, and spray drift (**Table 9**).

Table 8. Input Parameters Used in TERRPLANT 1.2.1 to Determine Terrestrial EECs for Plants for Tetraconazole Application

Input Variable	Parameter Value	Source
Maximum application rate	Small Vine Climbing Fruit Subgroup: 0.04 lb a.i./A Corn: 0.09 lb a.i./A Low Growing Berry Subgroup: 0.04 lb a.i./A	Product Label
Runoff value (0.01, 0.02, or 0.05 if chemical solubility <10, 10–100, or >100 ppm, respectively)	0.05 ^a	Tomlin 2003
Minimum incorporation depth (inches)	1	EFED default value
Toxicity Reference Values	<u>Seeding emergence</u> Monocots (all species tested) ^b : EC ₂₅ : >0.1 lbs a.i./A NOAEC: 0.1 lbs a.i./A <u>Dicots (all species tested) ^c:</u> EC ₂₅ : >0.1 lbs a.i./A NOAEC: 0.1 lbs a.i./A	MRID 45823209
	<u>Vegetative Vigor</u> Monocots (all species tested) ^b : EC ₂₅ : >0.1 lbs a.i./A NOAEC: 0.1 lbs a.i./A <u>Dicots (all species tested) ^c:</u> EC ₂₅ : >0.1 lbs a.i./A NOAEC: 0.1 lbs a.i./A	MRID 45823210

^a Based on the water solubility of 156 mg/L
^b Monocots tested: corn, onion, ryegrass, and wheat
^c Dicots tested: bean, cabbage, lettuce, radish, tomato, and soybean.

Table 9. Summary Output EECs from TERRPLANT for Tetraconazole

Use		EECs for Plants Inhabiting Areas Adjacent to Treatment Site (lbs a.i./A)	EECs for Semi-Aquatic Plants Inhabiting Areas Adjacent to Treatment Site (lbs a.i./A)	Drift EEC (lbs a.i./A)
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit)	G	<0.01	0.02	<0.01
	A	<0.01	0.02	<0.01
Corn	G	<0.01	0.05	<0.01
	A	0.01	0.05	<0.01
Low Growing Berry Subgroup	G	<0.01	0.02	<0.01
	A	<0.01	0.02	<0.01

4. Ecological Effects Summary

Effects characterization describes the types of effects a pesticide can have on aquatic or terrestrial organisms. Characterization is based on registrant-submitted studies that describe information regarding acute and chronic toxicity for various aquatic and terrestrial animals.

Detailed descriptions of acute, chronic, and sublethal effects of tetaconazole on aquatic and terrestrial species can be found in the July 1, 2008 comprehensive ecological risk assessment (D350213).

4.1. Toxicity Data for Aquatic Organisms

The most sensitive acute and chronic toxicity reference values associated with tetaconazole exposure of freshwater and estuarine/marine species are summarized in **Table 10**. Overall, tetaconazole is moderately toxic to freshwater fish, freshwater invertebrates, and estuarine/marine fish. Tetaconazole is highly toxic to estuarine/marine invertebrates (mysid and oyster) and aquatic plants.

4.2. Toxicity Data for Terrestrial Organisms

A summary of the most sensitive toxicity data associated with tetaconazole exposure to mammals, birds, and terrestrial plants is in **Table 11**. Additional information, including qualitative non-definitive endpoints, can be found in the previous assessment (D350213; July 1, 2008). Overall, tetaconazole is moderately toxic to birds on an acute oral basis, moderately to highly toxic to birds on an acute dietary basis, slightly toxic to mammals on an acute oral basis, and non-toxic to honey bees. Chronic effects observed in birds included reduced hatchling survival and growth. Chronic effects observed in mammals included decreased litter weight and mean pup weight, and increased relative liver weights of both sexes in all litters.

5. Ecological Risk Summary

Results of the exposure and toxicity effects data are used to evaluate the likelihood of adverse ecological effects on non-target species. For the assessment of tetaconazole risks, the risk quotient (RQ) method is used to compare estimated exposure concentrations and measured toxicity values. For non-target aquatic animals (i.e., fish and invertebrates) and plants (i.e., algae and macrophytes), surface water and pore water EECs were obtained from the PRZM/EXAMS model (see **Tables 3 and 4**). For non-target terrestrial species, EECs and RQs were obtained from the Tier I models T-REX for terrestrial animals (i.e., birds and mammals) and TERRPLANT for terrestrial and semi-aquatic plants. Toxicity reference values for aquatic and terrestrial organisms exposed to tetaconazole are summarized in **Table 10** and **Table 11**, respectively.

Table 10. Tetraconazole Toxicity Reference Values (TRVs) for Aquatic Organisms

Exposure Scenario	Species	Exposure Duration	Toxicity Reference Value ^a	Toxicity	Reference (Classification)
Freshwater Fish					
Acute	Bluegill sunfish	96 hours	96-Hour LC₅₀: 3.85 mg a.i./L NOAEC: 1.73 mg/L	moderately toxic	MRID 44367017 (Supplemental)
Chronic	Fathead minnow	34 days	NOAEC: 0.30 mg a.i./L LOAEC: 0.96 mg a.i./L (growth)	terminal growth (dry weight and length) affected at concentrations ≥ 0.96 mg a.i./L; loss of equilibrium at concentrations ≥ 3.21 mg a.i./L	MRID 45823208 (Supplemental)
Freshwater Invertebrates					
Acute	Waterflea	48 hours	48-hour LC₅₀: 2.63 mg a.i./L NOAEC: 0.48 mg a.i./L	moderately toxic	MRID 44267018 (Supplemental)
Chronic	Waterflea	21 days	NOAEC: 0.19 mg a.i./L LOAEC: 0.29 mg a.i./L (reproduction)	reproductive effects	MRID 45823207 (Acceptable)
Estuarine/Marine Fish					
Acute	Sheepshead minnow	96 hours	96-Hour LC₅₀: >3.4 mg a.i./L NOAEC: 1.6 mg a.i./L	moderately toxic	MRID 45823206 (Supplemental)
Chronic	No data submitted	NA	NOAEC: 0.265 mg a.i./L	NA	Estimated value ^c
Estuarine/Marine Invertebrates					
Acute (shrimp)	Mysid shrimp	96 hours	96-Hour LC₅₀: 0.44 mg a.i./L NOAEC: 0.25 mg a.i./L	highly toxic erratic swimming and lethargy	MRID 45823203 (Supplemental)
Acute (mollusk)	Eastern oyster	96 hours	96-hour EC₅₀: 1.0 mg a.i./L NOAEC: 0.81 mg a.i./L	highly toxic reduced shell deposition	MRID 45823202 (Acceptable)
Chronic (shrimp)	No data submitted	NA	NOAEC: 0.032 mg a.i./L	NA	Estimated value ^d
Chronic (mollusk)	No data submitted			NA	
Aquatic Plants					
Macrophytes	Duckweed	7 days	EC₅₀: 0.31 mg a.i./L NOAEC: 0.032 mg a.i./L	highly toxic	MRID 45842201 (Acceptable)
Freshwater Algae	No data submitted	NA	NA	NA	NA

Marine algae	No data submitted	NA			
Benthic Organisms					
Chironomid Emergence	<i>Chironomus riparius</i>	28 day	NOAEC: 2.97 mg a.i./L^b	NA	MRID 46614333
^a Toxicity reference values in bold are used to calculate RQs.					
^b based on nominal concentration in overlying water.					
^c A chronic estuarine/marine fish study was not proved. Estimated value is based on the assumption that the estuarine/marine fish acute to chronic ratio is similar to the freshwater fish acute to chronic ratio.					
^d A chronic estuarine/marine mysid study was not proved. Estimated value is based on the assumption that the estuarine/marine mysid acute to chronic ratio is similar to the freshwater invertebrate acute to chronic ratio.					

Table 11. Tetraconazole Toxicity Reference Values (TRVs) for Terrestrial Organisms

Exposure Scenario	Species	Exposure Duration	Toxicity Reference Value ^a	Toxicity	Reference (Classification)
Mammals					
Acute (Dose-based)	Rat	Single dose	LD₅₀ (females): 1031 mg a.i./kg bw NOAEL: 750 mg a.i./kg bw	slightly toxic	MRID 44268112 (Acceptable)
Chronic	Rat	2-generation reproduction	LOAEC: 70 mg a.i./kg diet NOAEC: 10 mg a.i./kg diet	Effects in offspring observed	MRID 44305306 (Acceptable)
Birds					
Acute (Dose-based)	Bobwhite quail	Single dose	LD₅₀: 131 mg a.i./kg bw NOAEL: 25 mg a.i./kg bw	moderately toxic	MRID 44367011 (Acceptable)
Acute (Diet-based)	Mallard duck	Acute dietary	LC₅₀: 382 mg a.i./kg diet NOAEC: <304 mg a.i./kg diet	highly toxic	MRID 44367012 (Acceptable)
Chronic (Diet-based)	Mallard duck	22 weeks	LOAEC: 50 mg a.i./kg diet NOAEC: 10 mg a.i./kg diet	Hatching survival and growth affected	MRID 44367014 (Acceptable)
Non-target Insects					
Oral Acute	Honey bee		LD ₅₀ : >130 µg/bee	NA	MRID 44320331 (Acceptable)
Contact Acute	Honey bee	96 hour	LD ₅₀ = 63 µg/bee	practically non-toxic	MRID 44340118 (Acceptable)
Contact Acute	Honey bee	72 hour	LD ₅₀ = 68 µg/bee	practically non-toxic	MRID 44340119 (Acceptable)
Acute	Earthworm	14 days 56 days	LC ₅₀ = 69.1mg/kg dw soil LC ₅₀ > 8.2 mg a.i./ kg dw soil	NA	MRID 46614305 MRID 46614306

Plants – Seedling Emergence								
Monocot	All species tested ^b	Single application	EC ₂₅ >0.1 lbs a.i./A NOAEC = 0.1 lbs a.i./A	NA		MRID 45823209 (Acceptable)		
Dicot	All species tested ^c	Single application	EC ₂₅ >0.1 lbs a.i./A NOAEC = 0.1 lbs a.i./A			MRID 45823209 (Acceptable)		
Plants – Vegetative Vigor								
Monocot	All species tested ^b	Single application	EC ₂₅ >0.1 lbs a.i./A NOAEC = 0.1 lbs a.i./A	NA		MRID 45823210 (Acceptable)		
Dicot	All species tested ^c	Single application	EC ₂₅ >0.1 lbs a.i./A NOAEC = 0.1 lbs a.i./A			MRID 45823210 (Acceptable)		

^a Toxicity reference values in **bold** are used to calculate RQs.

^b Monocots tested: corn, onion, ryegrass, and wheat.

^c Dicots tested: bean, cabbage, lettuce, radish, tomato, and soybean.

5.1. Potential Risks of Tetraconazole Exposure to Aquatic Organisms

The results of the risk estimation show that RQs do not exceed LOCs for aquatic species based on the proposed use of tetraconazole on fruit, berries, and corn (**Tables 12-14**). However, there is uncertainty regarding risk to aquatic non-vascular plants because toxicity data for these species was not submitted. Nevertheless, RQs are an order of magnitude less than the LOC for vascular plants, so risk to non-vascular plants is not expected.

Table 12. Risk Quotients for Aquatic Species for Parent Tetraconazole for Aerial (A) Application

Use	Freshwater Fish and Amp. RQs LC ₅₀ =3.85 ppm NOAEC=0.30 ppm		Freshwater Invertebrate RQs EC ₅₀ =2.63 ppm NOAEC=0.19 ppm		Estuarine/Marine Fish RQs LC ₅₀ >3.4 ppm NOAEC=0.265 ppm ¹		Estuarine/Marine Mysid RQs EC ₅₀ =0.44 ppm NOAEC=0.032 ppm	
	acute	chronic	acute	chronic	acute	chronic	acute	chronic
NY GRAPES								
Small Fruit Vine Climbing Subgroup 13-07F (except fuzzy kiwifruit)	A	< 0.01	0.02	< 0.01	0.03	< 0.01	0.02	0.01
FL STRAWBERRY								
Low-Growing Berry Subgroup 13-07G	A	< 0.01	0.05	0.01	0.08	< 0.01	0.06	0.04
KS CORN 2 applications	A	<0.01	0.03	<0.01	0.06	<0.01	0.04	0.02
KS Corn 1 application	A	<0.01	0.03	<0.01	0.05	<0.01	0.04	0.02

¹. Estimated value based on acute to chronic ratio for freshwater species

Table 13. Risk Quotients for Aquatic Species for Parent Tetraconazole for Aerial (A) Application

Use	Estuarine/Marine Oyster $EC_{50} = 1.0 \text{ ppm}$	Aquatic Vascular Plant (<i>Lemna gibba</i>) $EC_{50}=0.31 \text{ ppm}$ $\text{NOAEC}=0.032 \text{ ppm}$		
		chronic	non-listed	listed
NY GRAPES				
Small Fruit Vine Climbing Subgroup 13-07F (except fuzzy kiwifruit)	A	0.01	0.02	0.16
FL STRAWBERRY				
Low-Growing Berry Subgroup 13-07G	A	0.02	0.05	0.51
KS CORN 2 applications	A	0.01	0.03	0.33
KS CORN 1 application	A	0.01	0.03	0.33

Table 14. Risk Quotients for Aquatic Species for Parent Tetraconazole for Chemigation (C) and Aerial (A) Application

Benthic Organisms Chironomid Emergence $\text{NOAEC}=2.97 \text{ ppm}$		
Use	chronic	
CA GRAPES		
Small Fruit Vine Climbing Subgroup 13-07F (except fuzzy kiwifruit)	C	<0.01
FL STRAWBERRY		
Low-Growing Berry Subgroup 13-07G	A	0.01

5.1.1 Characterizing Tetraconazole Accumulation over Time

Figure 1 illustrates the temporal variation in the accumulation of tetraconazole over time in the standard EXAMS pond for the highest (FL Strawberry) exposure scenario for the water column concentrations. Examining the temporal trend in Figure 1, it can be seen that the tetraconazole

concentration continuously accumulates over the 30 years of the simulation. This accumulation is true for all modeled scenarios. Because tetraconazole does not appear to degrade in the aquatic or terrestrial environments according to the registrant-submitted fate studies, tetraconazole is assumed to be persistent and, therefore, will continuously accumulate in aquatic and terrestrial environments.

Typically EFED characterizes EECs in terms of 1-in-10-year concentrations. These 1-in-10-year concentrations are used in this document as a basis for calculating RQs. However, because the tetraconazole concentrations continuously accumulate and never level off, the EEC or RQ value for a scenario will always continue to increase with time and cannot be adequately described with a single EEC or RQ value.

To illustrate this point, using regression analyses from the PRZM/EXAM data along with the most sensitive endpoint and the Agency's LOCs, **Table 15** shows the time in years before there is acute and chronic risk to estuarine/marine invertebrates (acute endpoint = 440 ug/L; chronic endpoint = 32 ug/L). For example, there will be acute risk to listed (LOC = 0.05) and non-listed species (LOC = 0.5) in 39 and 387 years, respectively. In addition, there will be chronic risk to listed and non-listed species in 57 years. This captures the associated risk to estuarine/marine invertebrates of accumulating tetraconazole over time as a result of use on Florida Strawberry. **Table 15** also provides estimates of time until estuarine/marine invertebrate endpoints are exceeding for important crops from the other crop groups evaluated in this assessment.

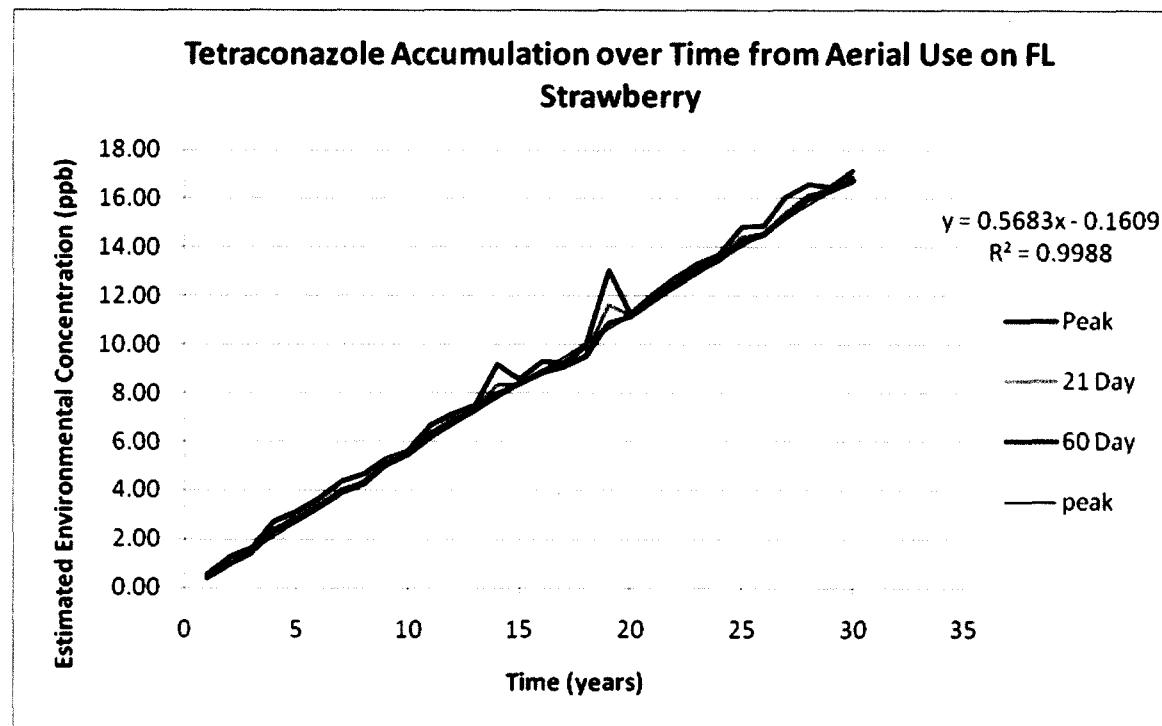


Figure 1. Accumulation of tetraconazole in the water column of the PRZM/EXAMS standard pond under proposed application rates from aerial use on Florida Strawberry.

Table 15. Time in Years before Acute and Chronic Risk to Estuarine/marine Invertebrates

Crop Grouping	Scenario	Acute Risk		Chronic Risk
		Listed Species (LOC = 0.05)	Non-Listed Species (LOC = 0.5)	Listed and Non-Listed Species (LOC = 1.0)
Low Growing Berry subgroup 13-07G	FL Strawberry	39	387	57
Corn	KS Corn	56	558	81
Small Fruit Vine Climbing subgroup 13-07F (except fuzzy kiwifruit)	NY Grapes	119	1190	174

Note: Mysid shrimp was used as the most sensitive endpoint for acute (440 ppb) and chronic (32 ppb) exposure.

5.2. Potential Risks of Tetraconazole Exposure to Terrestrial Organisms

RQ exceedances for terrestrial organisms are based on upper bound values.

5.2.1. Birds

Acute dose-based RQs for birds are summarized in **Table 16**. For application to fruit, corn, and berries, dose-based RQs exceed acute restricted use ($LOC \geq 0.2$) for small birds consuming short grass ($RQ = 0.20 - 0.32$). Dose-based RQs for small birds consuming broadleaf plants and small insects exceed acute endangered species risk ($LOC \geq 0.1$) for fruit ($RQ = 0.11$). For application to corn and berries, dose-based RQs exceed acute endangered risk for small birds consuming tall grass and broadleaf plants and small insects ($RQs = 0.12-0.18$) and medium-sized birds consuming short grass ($RQ = 0.12-0.14$). Acute dietary-based LOCs for birds are not exceeded (**Table 17**).

Chronic dietary-based RQs for birds are summarized in **Table 18**. For application to fruit, corn, and berries, all dietary-based RQs exceed chronic levels of concern ($LOC \geq 1$) for birds consuming short grass ($RQs = 1.69-2.66$). The dietary-based chronic RQs exceed levels of concern for birds consuming broadleaf plants and small insects ($RQ = 1.22-1.49$) for application to corn and berries. Additionally, for application to berries, the dietary-based chronic RQ exceeds the LOC for birds consuming tall grass ($RQ = 1.22$).

Table 16. Dose-Based Acute RQs for Birds Exposed to Tetraconazole Based on Upper Bound and Mean Residues (shown in parentheses) as Calculated by T-REX.

Crop Use (Maximum Application Rate)	Body Weight (g)	Avian Acute Risk Quotients ^{a,b}			
		Short Grass	Tall Grass	Broadleaf Plants/ Small Insects	Fruits/Pods/ Large Insects
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	20	0.20** (0.07)	0.09 (0.03)	0.11* (0.04)	0.01 (0.01)
	100	0.09 (0.03)	0.04 (0.01)	0.05 (0.02)	<0.01 (<0.01)
	1000	0.03 (0.01)	0.01 (<0.01)	0.02 (0.01)	<0.01 (<0.01)
Corn 0.09 lbs a.i./A, 1 application	20	0.26** (0.09)	0.12* (0.04)	0.15* (0.05)	0.02 (0.01)
	100	0.12* (0.04)	0.05 (0.02)	0.07 (0.02)	0.01 (<0.01)
	1000	0.04 (0.01)	0.02 (0.01)	0.02 (0.01)	<0.01 (<0.01)
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	20	0.32** (0.11)	0.15* (0.05)	0.18* (0.06)	0.02 (0.01)
	100	0.14* (0.05)	0.07 (0.02)	0.08 (0.03)	0.01 (<0.01)
	1000	0.05 (0.02)	0.02 (0.01)	0.03 (0.01)	<0.01 (<0.01)

^a Acute dose-based RQ = EEC/LD₅₀, where EEC values are upper bound residues expressed as equivalent dose (mg a.i./kg body weight) and the toxicity value is the acute dose-based LD₅₀ = 131mg a.i./kg body weight in bobwhite quail.
^b Numbers in () are acute RQs based on mean residues
* Exceeds Acute Endangered Species Risk LOC (≥ 0.1)
** Exceeds Acute Restricted Use LOC (≥ 0.2)
*** Exceeds Acute Risk LOC (≥ 0.5)

Table 17. Dietary-Based Acute RQs for Birds Exposed to Tetraconazole Based on Upper Bound and Mean Residues (shown in parentheses) as Calculated by T-REX

Crop Use (Maximum Application Rate)	Avian Acute Risk Quotients ^{a,b}			
	Short Grass	Tall Grass	Broadleaf Plants/Small Insects	Fruits/Pods/Large Insects
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	0.04 (0.01)	0.02 (0.01)	0.02 (0.01)	<0.01 (<0.01)

Corn 0.09 lbs a.i./A, 1 application	0.06 (0.02)	0.03 (0.01)	0.03 (0.01)	<0.01 (<0.01)
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	0.07 (0.02)	0.03 (0.01)	0.04 (0.01)	<0.01 (<0.01)

^a Acute dietary-based RQ = EEC/LC₅₀, where EEC values are upper bound residues expressed as dietary concentrations (mg a.i./kg diet) generated from T-REX and the toxicity value is the acute dietary-based LC₅₀ = 382 mg a.i./kg diet in mallard ducks.
^b Numbers in () are acute dietary-based RQs where EEC values are mean residues.

Table 18. Dietary-Based Chronic RQs for Birds Exposed to Tetraconazole Based on Upper Bound and Mean Residues (shown in parentheses) as Calculated by T-REX

Crop Use (Maximum Application Rate)	Avian Chronic Risk Quotients ^{a,b}			
	Short Grass	Tall Grass	Broadleaf Plants/Small Insects	Fruits/Pods/Large Insects
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	1.69+ (0.60)	0.77 (0.25)	0.95 (0.32)	0.11 (0.05)
Corn 0.09 lbs a.i./A, 1 application	2.16+ (0.77)	0.99 (0.32)	1.22+ (0.41)	0.14 (0.06)
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	2.66+ (0.94)	1.22+ (0.40)	1.49+ (0.50)	0.17 (0.08)

^a Chronic dietary-based RQ = EEC/NOAEC, where EECs values are upper bound residues expressed as dietary concentrations (mg a.i./kg diet) generated from T-REX and the toxicity value is the chronic dietary NOAEL value of 10 mg a.i./kg diet in mallard ducks.
^b Numbers in () are chronic dietary-based RQs where EECs values are mean residues
+ Exceeds Chronic LOC (≥ 1)

5.2.2. Mammals

Dose-based acute RQs, dietary-based chronic RQs, and dose-based chronic RQs for mammals are summarized in **Tables 19, 20, and 21**. For application to fruit, corn, and berries, acute dose-based LOCs are not exceeded (**Table 19**). Chronic dietary-based RQs exceed levels of concern (LOC ≥ 1) for mammals consuming short grass for all crop uses (RQs = 1.69-2.66), for mammals consuming broadleaf plants and small insects for corn and berries (RQ = 1.22-1.49), and for mammals consuming tall grass for berries (RQ = 1.22, **Table 20**). Chronic dose-based RQs exceed chronic levels of concern for small, medium, and large mammals consuming short grass,

tall grass, and broadleaf plants and small insects for fruit, corn, and berries (RQs = 3.07-23.05, **Table 21**). Chronic dose-based RQs for small and medium mammals consuming fruits, pods, and large insects exceed chronic levels of concern for corn and berries (RQs = 1.00-1.44, **Table 21**).

Table 19. Dose-based Acute RQs for Mammals Exposed to Tetraconazole Based on Upper Bound as Calculated by T-REX

Crop Use (Maximum Application Rate)	Body Weight (g)	Mammalian Acute Risk Quotients ^a				
		Short Grass	Tall Grass	Broadleaf Plants/Small Insects	Fruits/Pods/Large Insects	Seeds
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	15	0.01	<0.01	<0.01	<0.01	<0.01
	35	0.01	<0.01	<0.01	<0.01	<0.01
	1000	<0.01	<0.01	<0.01	<0.01	<0.01
Corn 0.09 lbs a.i./A, 1 application	15	0.01	<0.01	0.01	<0.01	<0.01
	35	0.01	<0.01	<0.01	<0.01	<0.01
	1000	<0.01	<0.01	<0.01	<0.01	<0.01
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	15	0.01	0.01	0.01	<0.01	<0.01
	35	0.01	<0.01	0.01	<0.01	<0.01
	1000	0.01	<0.01	<0.01	<0.01	<0.01

^a Dose-based acute RQ = EEC/NOAEL, where EECs values are upper bound residues expressed as equivalent dose (mg a.i./kg body weight) generated from T-REX and the acute toxicity value is the LD₅₀ = 1031 mg a.i./kg body weight in rats.

Table 20. Dietary-Based Chronic RQs for Mammals Exposed to Tetraconazole Based on Upper Bound and Mean Residues (shown in parentheses) as Calculated by T-REX

Crop Use (Maximum Application Rate)	Mammalian Chronic Risk Quotients ^{a,b}			
	Short Grass	Tall Grass	Broadleaf Plants/Small Insects	Fruits/Pods/Large Insects
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	1.69+ (0.60)	0.77 (0.25)	0.95 (0.32)	0.11 (0.05)

Corn 0.09 lbs a.i./A, 1 application	2.16+ (0.77)	0.99 (0.32)	1.22+ (0.41)	0.14 (0.06)
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	2.66+ (0.94)	1.22+ (0.40)	1.49+ (0.50)	0.17 (0.08)
^a Dietary-based RQs = EEC/NOAEC, where EEC values are upper bound residues expressed as dietary concentrations (mg a.i./kg diet) generated from T-REX and the toxicity value is the chronic dietary NOAEC value of 10 mg a.i./kg diet in rats.				
^b Numbers in () are dietary-based RQs = EEC/NOAEC, where EEC values are mean residues				
+ Exceeds Chronic LOC (≥ 1)				

Table 21. Dose-based Chronic RQs for Mammals Exposed to Tetraconazole Based on Upper Bound and Mean Residues (shown in parentheses) as Calculated by T-REX

Crop Use (Maximum Application Rate)	Body Weight (g)	Mammalian Chronic Risk Quotients ^a				
		Short Grass	Tall Grass	Broadleaf Plants/Small Insects	Fruits/Pods/Large Insects	Seeds
Small Fruit Vine Climbing Subgroup (except fuzzy kiwifruit) 0.04 lbs a.i./A, 2 applications, 14-day interval	15	14.64+ (4.35+)	6.71+ (1.84+)	8.24+ (2.30+)	0.92 (0.36)	0.20 (0.08)
	35	12.51+ (3.71+)	5.73+ (1.57+)	7.03+ (1.97+)	0.78 (0.31)	0.17 (0.07)
	1000	6.70+ (1.99+)	3.07+ (0.84)	3.77+ (1.05+)	0.42 (0.16)	0.09 (0.04)
Corn 0.09 lbs a.i./A, 1 application	15	18.74+ (6.64+)	8.59+ (2.81+)	10.54+ (3.51+)	1.17+ (0.55)	0.26 (0.12)
	35	16.01+ (5.67+)	7.34+ (2.40+)	9.00+ (3.00+)	1.00+ (0.47)	0.22 (0.10)
	1000	8.58+ (3.04+)	3.93+ (1.29+)	4.83+ (1.61+)	0.54 (0.25)	0.12 (0.06)
Low Growing Berry Subgroup 0.04 lbs a.i./A, 4 applications, 14-day interval	15	23.05+ (8.16+)	10.56+ (3.46+)	12.97+ (4.32+)	1.44+ (0.67)	0.32 (0.15)
	35	19.69+ (6.97+)	9.02+ (2.95+)	11.08+ (3.69+)	1.23+ (0.57)	0.27 (0.13)
	1000	10.55+ (3.74+)	4.84+ (1.58+)	5.94+ (1.98+)	0.66 (0.31)	0.15 (0.07)

a Dose-based chronic RQ = EEC/NOAEC, where EEC values are upper bound residues expressed as equivalent dose (mg a.i./kg body weight) generated from T-REX and the chronic toxicity value is the chronic NOAEL = 0.5 mg a.i./kg body weight in rats, converted from the NOAEC of 10 mg a.i./kg diet in the rat using the standard FDA lab rat conversion by T-REX.

b Numbers in () are does-based chronic RQs, where EEC values are mean residues

+ Exceeds Chronic LOC (≥ 1)

5.2.3. Plants

The TERRPLANT model was used to estimate risk quotients to non-listed monocots and dicots using the EC₂₅ value and to listed monocots and dicots using the NOAEC or EC₀₅ value (the EC₀₅ is used in the absence of a definitive NOAEC to assess risks to listed terrestrial and semi-aquatic plants). All RQs for non-listed and listed plants are below the LOC (1) for all proposed use on fruits, corn, and berries for monocots and dicots (RQ <0.1 to 0.50, **Table 22**).

Table 22. Risk Quotients for Non-Listed and Listed Terrestrial and Semi-Aquatic Plants in Areas Adjacent to Treatment Sites by Aerial (A) and Ground (G) Application of Tetraconazole

Use	Risk Quotient					
	Terrestrial Plant Emergence (Adjacent Area)		Semi-Aquatic Plant Emergence (Adjacent Area)		Terrestrial Plant Vegetative Vigor (Drift)	
	Monocot	Dicot	Monocot	Dicot	Monocot	Dicot
Non-listed^a						
Small Fruit Vine Climbing (except fuzzy kiwifruit)	A	<0.1	<0.1	<0.22	<0.22	<0.1
	G	<0.1	<0.1	<0.20	<0.20	<0.1
Corn	A	<0.1	<0.1	<0.50	<0.50	<0.1
	G	<0.1	<0.1	<0.46	<0.46	<0.1
Low Growing Berry Subgroup	A	<0.1	<0.1	<0.22	<0.22	<0.1
	G	<0.1	<0.1	<0.20	<0.20	<0.1
Listed^b						
Small Fruit Vine Climbing (except fuzzy kiwifruit)	A	<0.1	<0.1	0.22	0.22	<0.1
	G	<0.1	<0.1	0.20	0.20	<0.1
Corn	A	<0.1	<0.1	0.50	0.50	<0.1
	G	<0.1	<0.1	0.46	0.46	<0.1
Low Growing Berry Subgroup	A	<0.1	<0.1	0.22	0.22	<0.1
	G	<0.1	<0.1	0.20	0.20	<0.1

^a Based on the EC₂₅ value >0.1 lbs a.i./A for seedling emergence in monocots (all species tested) and the EC₂₅ value >0.1 lbs a.i./A in dicots (all species tested).

^b Based on the NOAEC value = 0.1 lbs a.i./A for seedling emergence in monocots (all species tested) and the NOAEC value 0.1 lbs a.i./A in dicots (all species tested).

5.2.4. Invertebrates

Currently, EFED does not routinely quantify potential risks of pesticides on non-listed terrestrial adult insects. Although exposure to non-target beneficial invertebrates is possible, toxicity

studies for honey bees and earthworms showed that tetaconazole is practically non-toxic to these organisms (D350213, July 1, 2008). These results do not warrant the need for additional studies at this time.

6. Incident Data

Incident reports submitted to EPA since approximately 1994 have been tracked by assignment of EIIS (Environmental Incident Information System) in an Incident Data System (IDS). Currently, there are no incident reports for tetaconazole.

7. Data Gaps and Uncertainties

Data gaps and uncertainties for this assessment are the same as those identified in the previous assessment (D350213, July 1, 2008) including a submission of a new guideline adsorption/desorption study and uncertainties regarding the foliar dissipation rate, canopy interception, and tetaconazole degradates.

To describe soil:water partition coefficient, the average K_{OC} value was used. The individual soil:water partition coefficients (i.e. 1004, 769, 428 and 2036 L/kg) were based on an upgradeable supplemental adsorption/desorption study. None of the soil (German sand, German sandy loam, English clay, and English clay loam) used in the batch equilibrium study was the same type of soil that was used in the aerobic soil metabolism study (a sandy loam soil from Davidson, Georgia, MRID 44367005). One of the soils used in the batch equilibrium study had a very high organic matter content of 48.5% ($K_{OC} = 2036$ L/kg, $K_{DL} = 580$). A soil with such high organic matter content may not be representative of the agricultural soils in intended use areas and may not be an appropriate soil for assessing the mobility of the chemical in batch equilibrium studies. To address uncertainties in the risk assessment and satisfy the data requirements (Sec 3, March 2005), EFED requested a submission of a new guideline adsorption/desorption study (163-1).

The foliar dissipation rate constant used in PRZM was obtained primarily from studies using sugar beets. It is uncertain whether or not this value is transferable to the other crops studied in this assessment. In addition, a study concluded that canopy interception may remove as much as 25% of the initially applied amount of tetaconazole available for runoff and erosion. Since canopy interception is difficult to account for in PRZM and is not likely to be consistent for all the crops studied, it was not included in the assessment.

Tetaconazole degradates were not analyzed in any of the terrestrial field studies. The registrant-proposed degradation pathway suggests that tetaconazole (M14360) degrades to form M14360-difluoroacetic acid and M14360-alcohol, which further degrade to form M14360-acid and 1,2,4-triazole, respectively. In the soil photodegradation study 3.7% of 1,2,4-triazole was formed from tetaconazole at 112-days posttreatment. In the aqueous photolysis study 6.7% of 1,2,4-triazole was formed from tetaconazole at 30-days posttreatment. 1,2,4-Triazole and its conjugates (triazole alanine and triazole acetic acid) are common metabolites to the class of compounds known as the triazoles (a.k.a. triazole-derivative fungicides, T-D fungicides, conazoles). A separate risk assessment was conducted on 1,2,4-triazole degradate. The Office of Pesticide Program's Health Effects Division (HED) has conducted aggregate human health risk

assessments for 1,2,4-triazole and triazole conjugates which was completed on Feb 7, 2006 (D320683). The Tier II drinking water assessment for 1,2,4-triazole was completed in Feb 28, 2006 (D320682). The ecological risk assessment for 1,2,4-triazole was not performed.

8. Endangered and Threatened Species

8.1. Probit Dose Response Relationship

For fish, invertebrates, birds, and mammals the individual effect probabilities were calculated based on an Excel spreadsheet tool IECV1.1 (Individual Effect Chance Model Version 1.1) developed by U.S. EPA, OPP, Environmental Fate and Effects Division (June 22, 2004). The model allows for such calculations by entering the mean slope estimate (and the 95% confidence bounds of that estimate) as the slope parameter for the spreadsheet.

Due to partial mortalities, the slope of the mortality curve could not be determined for the avian toxicity studies. As a result, the calculation of the chance of an individual event occurrence is based on a default slope assumption of 4.5. The estimated chance of individual mortality associated with the acute endangered species risk LOC of 0.1 is approximately **1 in 300,000**. The extrapolation of very low probability events is associated with considerable uncertainty in the resulting estimates. To explore the possible bounds of these estimates, the upper and lower values for the default mean (2-9) were used to calculate the upper and lower estimates of the effects probability associated with the acute endangered species risk LOC. These values are **1 in 44** and **1 in 8.9×10^{18}** , respectively. The estimated chance of individual mortality associate with the acute restricted use LOC of 0.2 is **1 in 1,210**. The upper and lower estimates of the effects probability associated with the acute restricted use LOC are approximately **1 in 12** and **1 in 6×10^9** .

Based on the screening level assessment, the highest acute endangered species risk quotient for small birds located near tetriconazole application on low growing berries is 0.18. The probability of individual mortality based on the calculated RQ is **1 in 2,490** for potentially exposed birds (20 g) at the predicted exposures for tetriconazole application to low growing berries. The highest acute restricted use risk quotient for small birds located near tetriconazole application on berries is 0.32. The probability of individual mortality based on the calculated RQ is **1 in 77** for potentially exposed birds (20 g) at the predicted exposures for tetriconazole application to berries.

8.2. LOCATES

LOCATES was used to identify listed species that may be affected by labeled uses of tetriconazole in counties throughout the United States. Results of the LOCATES run can be found in **Appendix B**.

Appendix A. Representative PRZM/EXAMS Output File for Florida Strawberry – Aerial

stored as FLstrawberryAeco.out
 Chemical: Tetraconazole
 PRZM environment: FLstrawberry_WirrigSTD.txt modified Tuesday, 29 May 2007 at 13:53:40
 EXAMS environment: pond298.exe modified Tuesday, 26 August 2008 at 06:14:07
 Metfile: w12842.dvf modified Tuesday, 26 August 2008 at 06:14:20
 Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.51	0.47	0.40	0.36	0.34	0.26
1962	1.20	1.13	0.95	0.89	0.85	0.64
1963	1.52	1.45	1.33	1.27	1.25	1.13
1964	2.48	2.36	2.13	2.08	2.03	1.75
1965	2.74	2.65	2.51	2.37	2.34	2.15
1966	3.09	3.02	2.82	2.69	2.67	2.51
1967	3.59	3.49	3.26	3.09	3.04	2.82
1968	3.73	3.62	3.42	3.29	3.28	3.12
1969	4.10	4.02	3.95	3.83	3.79	3.60
1970	4.22	4.16	4.05	3.98	3.94	3.89
1971	4.87	4.78	4.54	4.40	4.37	4.16
1972	5.05	4.95	4.83	4.65	4.62	4.46
1973	5.26	5.16	4.91	4.84	4.79	4.69
1974	6.48	6.21	5.60	5.20	5.12	4.85
1975	5.48	5.38	5.20	5.11	5.08	4.97
1976	5.90	5.81	5.51	5.41	5.35	5.18
1977	5.36	5.34	5.31	5.28	5.26	5.16
1978	5.91	5.82	5.58	5.41	5.36	5.25
1979	8.54	8.14	7.09	6.34	6.20	5.82
1980	6.34	6.27	6.11	6.05	6.04	5.97
1981	6.71	6.59	6.35	6.21	6.16	6.09
1982	6.88	6.80	6.67	6.58	6.53	6.32
1983	7.03	6.94	6.80	6.71	6.70	6.60
1984	6.94	6.87	6.69	6.64	6.62	6.55
1985	7.45	7.33	7.00	6.82	6.77	6.59
1986	7.34	7.23	6.98	6.80	6.75	6.66
1987	8.01	7.82	7.37	7.07	7.00	6.83
1988	7.72	7.58	7.30	7.11	7.04	6.88
1989	7.21	7.16	7.04	6.99	6.98	6.87
1990	7.38	7.29	7.12	6.97	6.94	6.83

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.03	8.54	8.14	7.37	7.11	7.04	6.88
0.06	8.01	7.82	7.30	7.07	7.00	6.87
0.10	7.72	7.58	7.12	6.99	6.98	6.83
0.13	7.45	7.33	7.09	6.97	6.94	6.83
0.16	7.38	7.29	7.04	6.82	6.77	6.66
0.19	7.34	7.23	7.00	6.80	6.75	6.60
0.23	7.21	7.16	6.98	6.71	6.70	6.59
0.26	7.03	6.94	6.80	6.64	6.62	6.55
0.29	6.94	6.87	6.69	6.58	6.53	6.32
0.32	6.88	6.80	6.67	6.34	6.20	6.09
0.35	6.71	6.59	6.35	6.21	6.16	5.97
0.39	6.48	6.27	6.11	6.05	6.04	5.82
0.42	6.34	6.21	5.60	5.41	5.36	5.25
0.45	5.91	5.82	5.58	5.41	5.35	5.18
0.48	5.90	5.81	5.51	5.28	5.26	5.16
0.52	5.48	5.38	5.31	5.20	5.12	4.97
0.55	5.36	5.34	5.20	5.11	5.08	4.85
0.58	5.26	5.16	4.91	4.84	4.79	4.69
0.61	5.05	4.95	4.83	4.65	4.62	4.46
0.65	4.87	4.78	4.54	4.40	4.37	4.16
0.68	4.22	4.16	4.05	3.98	3.94	3.89
0.71	4.10	4.02	3.95	3.83	3.79	3.60
0.74	3.73	3.62	3.42	3.29	3.28	3.12
0.77	3.59	3.49	3.26	3.09	3.04	2.82
0.81	3.09	3.02	2.82	2.69	2.67	2.51
0.84	2.74	2.65	2.51	2.37	2.34	2.15
0.87	2.48	2.36	2.13	2.08	2.03	1.75
0.90	1.52	1.45	1.33	1.27	1.25	1.13
0.94	1.20	1.13	0.95	0.89	0.85	0.64
0.97	0.51	0.47	0.40	0.36	0.34	0.26
0.10	7.69	7.56	7.12	6.99	6.97	6.83
				Average of		4.62

Inputs generated by pe5.pl - November 2006

Data used for this run:
 Output File: FLstrawberryAeco
 Metfile: w12842.dvf
 PRZM scenario: FLstrawberry_WirrigSTD.txt
 EXAMS environment file: pond298.exe
 Chemical Name:
 Description:
 Molecular weight:
 Henry's Law Const:
 Vapor Pressure:
 Solubility:
 Kd:
 Koc:
 Photolysis half-life:
 Aerobic Aquatic Metabolism:
 Anaerobic Aquatic Metabolism:
 Aerobic Soil Metabolism:
 Hydrolysis:
 Method:
 Incorporation Depth:
 Application Rate:
 Application Efficiency:
 Spray Drift:
 Application Date:
 Interval 1:
 app. rate 1:
 Interval 2:
 app. rate 2:
 Interval 3:
 app. rate 3:
 Record 17:
 Record 18:
 Flag for Index Res. Run
 Flag for runoff calc.

Variable	Na	Value	Units	Comments
mwt		372.1	g/mol	
henry		3.50E-09	atm-m^3/mol	
vapr		9.90E-07	torr	
sol		156	mg/L	
Kd			mg/L	
Koc		4424	mg/L	
kdp		215	days	Half-life
kbacw		447	days	Half-life
kbacs		0	days	Half-life
asm		0	days	Half-life
pH 7		0	days	Half-life
CAM		2	integer	See PRZM manual
DEPI			cm	
TAPP		0.045	kg/ha	
APPEFF		0.95	fraction	
DRFT		0.05	fraction of application rate applied to pond	
Date		04-01	dd/mm or dd/mmm or dd-mm or dd-mmm	
interval		14	days	Set to 0 or delete line for single app
apprate		0.045	kg/ha	
interval		14	days	Set to 0 or delete line for single app
apprate		0.045	kg/ha	
interval		14	days	Set to 0 or delete line for single app
apprate		0.045	kg/ha	
FILTRA			3	
IPSCND				
UPTKF				
PLVKRT				
PLDKRT				
FEXTRC		0.5		
IR	EPA Pond			
RUNOFF	none		none, monthly or total(average of entire run)	

Appendix B. Results from the LOCATES database for fruits, berries, and corn.

Species in Counties by State and Taxa

No species were excluded

Minimum of 1 Acre

All Medium Types Reported

Mammal, Bird, Amphibian, Reptile

grapes, berries, all, kiwifruit, strawberries, berries - other, popcorn (shelled), corn for grain, corn for silage or greenchop, sweet corn, sweet corn for seed

AL, AK, AZ, AR, CA, CO, CT, DE, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY

Alabama

Amphibian

Salamander, Flatwoods
Ambystoma cingulatum

Baldwin
Covington
Houston
Mobile

Salamander, Red Hills
Phaeognathus hubrichti

Butler
Conecuh
Covington
Crenshaw
Monroe

Bird

Plover, Piping
Charadrius melanotos
ammobates

Baldwin
Mobile

Stork, Wood
trissuliceps

Mycteria americana
Autauga
Barbour
Choctaw

Clarke
Colbert
Dallas
Escambia
Lowndes
Montgomery
Washington
Wilcox

Bird

Woodpecker, Red-cockaded

Picoides borealis
Baldwin

Bibb
Calhoun
Cleburne
Conecuh
Coosa
Covington

Dallas
Escambia
Geneva
Hale
Lawrence
Macon
Marshall

Perry
Pickens

Russell
Talladega
Tallapoosa

Tuscaloosa
Winston

Mammal

Bat, Gray
Myotis grisescens
Calhoun
Colbert
Conecuh
De Kalb
Jackson
Lauderdale
Lawrence

Mammal

Limestone
Madison
Marshall

Morgan
Shelby
Bat, Indiana
Myotis sodalis
Autauga
Colbert

De Kalb
Jackson
Lawrence
Limestone
Marshall
Morgan
Shelby

Mouse, Alabama Beach
Peromyscus polionotus

Baldwin
Mouse, Perdido Key Beach
Peromyscus polionotus

Baldwin

Reptile
Sea turtle, loggerhead
Caretta caretta
Caretta caretta
Baldwin
Mobile
Snake, Eastern Indigo
Drymarchon corais couperi
Baldwin
Bullock
Conecuh

Reptile

Covington	Bird
Escambia	Bobwhite, Masked <i>Colinus virginianus ridgwayi</i>
Geneva	Pima
Mobile	Condor, California <i>Gymnogyps californianus</i>
Washington	Apache
Tortoise, Gopher	Coconino
<i>Gopherus polyphemus</i>	Mohave
Choctaw	Navajo
Mobile	Eagle, Bald <i>Haliaeetus leucocephalus</i>
Sumter	Graham
Washington	La Paz
Turtle, Alabama Red-bellied	Maricopa
<i>Pseudemys alabamensis</i>	Mohave
Baldwin	Pinal
Mobile	Yavapai
Turtle, Flattened Musk	Yuma
<i>Stemotherus depressus</i>	Falcon, Northern Aplomado <i>Falco femoralis septentrionalis</i>
Blount	Cochise
Cullman	Santa Cruz
Etowah	Flycatcher, Southwestern Willow <i>Empidonax traillii extimus</i>
Jefferson	Apache
Marshall	Cochise
Tuscaloosa	Coconino
Walker	Graham
Winston	<i>Leptonycteris curasoae yerbabuenae</i>

Arizona

nosed

Amphibian

nosed	Bird
Frog, Chiricahua Leopard	Greenlee
<i>Rana chiricahuensis</i>	La Paz
Apache	Maricopa
Cochise	Mohave
Coconino	Navajo
Graham	Pima
Greenlee	Pinal
Navajo	Santa Cruz
Pima	Yavapai
Santa Cruz	Yuma
Yavapai	Owl, Mexican Spotted <i>Strix occidentalis lucida</i>

Salamander, Sonora Tiger	Bird
<i>Ambystoma tigrinum stebbinsi</i>	Apache
Cochise	Coconino
Santa Cruz	Navajo

Bird

Bird

Bobwhite, Masked	Bird
<i>Colinus virginianus ridgwayi</i>	Greenlee
Pima	Maricopa
Condor, California	Mohave
<i>Gymnogyps californianus</i>	Navajo
Apache	Pinal
Coconino	Santa Cruz
Mohave	Yavapai
Navajo	Pygmy-owl, Cactus Ferruginous <i>Glaucidium brasilianum cactorum</i>
Eagle, Bald	Cochise
<i>Haliaeetus leucocephalus</i>	Graham
Graham	Greenlee
La Paz	Maricopa
Maricopa	Pima
Mohave	Pinal
Pinal	Santa Cruz
Yavapai	Yuma
Yuma	Rail, Yuma Clapper <i>Rallus longirostris yumanensis</i>
Falcon, Northern Aplomado	La Paz
<i>Falco femoralis septentrionalis</i>	Maricopa
Cochise	Mohave
Santa Cruz	Pinal
Flycatcher, Southwestern Willow	Yuma
<i>Empidonax traillii extimus</i>	Mammal
Apache	Bat, Lesser (=Sanborn's) Long-
Cochise	Bat, Lesser (=Sanborn's) Long-
Coconino	Cochise
Graham	Graham
<i>Leptonycteris curasoae yerbabuenae</i>	Greenlee
Greenlee	Maricopa
La Paz	Pima
Maricopa	Pinal
Mohave	Santa Cruz
Navajo	Yavapai
Pima	Yuma
Pinal	Ferret, Black-footed
Santa Cruz	<i>Mustela nigripes</i>
Yavapai	Apache
Owl, Mexican Spotted	Coconino
<i>Strix occidentalis lucida</i>	Navajo
Apache	Jaguar
Cochise	<i>Panthera onca</i>
Coconino	
Graham	

<u>Mammal</u>	<u>Bird</u>	<u>Mammal</u>
Cochise	Conway	Independence
Graham	Crawford	Izard
Greenlee	Crittenden	Lawrence
Pima	Desha	Madison
Pinal	Faulkner	Marion
Santa Cruz	Franklin	Newton
Jaguarundi, Sinaloan	Jefferson	Pope
<i>Herpailurus (=Felis) yagouaroundi tolteca</i>	Johnson	Searcy
	Lee	Sharp
Cochise	Lincoln	Stone
Graham	Logan	Van Buren
Ocelot	Lonoke	Washington
<i>Leopardus (=Felis) pardalis</i>	Mississippi	Bat, Indiana
Cochise	Perry	<i>Myotis sodalis</i>
Graham	Phillips	Izard
Pima	Pope	Newton
Santa Cruz	Pulaski	Stone
Pronghorn, Sonoran	Sebastian	Bat, Ozark Big-eared
<i>Antilocapra americana sonoriensis townsendii</i>	St. Francis	<i>Corynorhinus (=Plecotus)</i>
Maricopa	Yell	
Pima	Woodpecker, Red-cockaded	<i>ingens</i>
Yuma	<i>Picoides borealis</i>	Marion
Squirrel, Mount Graham Red	Ashley	Washington
<i>Tamiasciurus hudsonicus grahamensis</i>	Bradley	
Graham	Calhoun	
Vole, Hualapai Mexican	Clark	Frog, California Red-legged
<i>Microtus mexicanus hualpaiensis</i>	Drew	<i>Rana aurora draytonii</i>
Coconino	Grant	Alameda
Mohave	Jefferson	Butte
<u>Reptile</u>	Lafayette	Calaveras
Rattlesnake, New Mexican Ridge-nosed	Perry	Contra Costa
<i>Crotalus willardi obscurus</i>	Polk	
Cochise	Pulaski	Del Norte
Tortoise, Desert	Saline	El Dorado
<i>Gopherus agassizii</i>	Scott	Kern
Coconino	Union	Los Angeles
Mohave	Yell	Marin
Arkansas		Merced
<u>Bird</u>		Monterey
Tern, Interior (population) Least	<u>Mammal</u>	Napa
<i>Sterna antillarum</i>	Bat, Gray	Nevada
Arkansas	<i>Myotis grisescens</i>	San Benito
Chicot	Baxter	San Luis Obispo
	Benton	San Luis Obispo
	Boone	San Mateo
	Carroll	San Mateo
		Santa Barbara
		Santa Clara

<u>Amphibian</u>	<u>Amphibian</u>	<u>Bird</u>
Santa Cruz	Monterey	Orange
Shasta	Orange	San Diego
Solano	Riverside	San Luis Obispo
Ventura	San Bernardino	San Mateo
Yuba	San Diego	Santa Barbara
Frog, Mountain Yellow-legged	Santa Barbara	Santa Cruz
<i>Gopherus agassizii</i>	Ventura	Siskiyou
Los Angeles	<u>Bird</u>	Sonoma
Riverside	Condor, California	Owl, Northern Spotted
San Bernardino	<i>Gymnogyps californianus</i>	<i>Strix occidentalis caurina</i>
Salamander, California Tiger	Kern	Colusa
<i>Ambystoma californiense</i>	Los Angeles	Del Norte
Alameda	Monterey	Glenn
Contra Costa	San Luis Obispo	Humboldt
Fresno	Santa Barbara	Lake
Kern	Tulare	Lassen
Kings	Ventura	Marin
Madera	Flycatcher, Southwestern Willow	Mendocino
Merced	<i>Empidonax traillii extimus</i>	Napa
Monterey	Kern	Shasta
Sacramento	Los Angeles	Siskiyou
San Bernardino	Riverside	Sonoma
San Joaquin	San Bernardino	Tehama
San Luis Obispo	San Diego	Trinity
San Mateo	Santa Barbara	Plover, Western Snowy
Santa Barbara	Gnatcatcher, Coastal California	<i>Charadrius alexandrinus nivosus</i>
Santa Clara	<i>Polioptila californica californica</i>	Alameda
Santa Cruz	Los Angeles	Del Norte
Solano	Orange	Humboldt
Sonoma	Riverside	Los Angeles
Stanislaus	San Bernardino	Marin
Tulare	San Diego	Mendocino
Yolo	Ventura	Monterey
Salamander, Desert Slender	Murrelet, Marbled	Napa
<i>Batrachoseps aridus</i>	<i>Brachyramphus marmoratus</i>	Orange
Riverside	<i>marmoratus</i>	San Diego
Salamander, Santa Cruz Long-toed	Del Norte	San Luis Obispo
<i>Ambystoma macrodactylum croceum</i>	Glenn	San Mateo
Monterey	Humboldt	Santa Barbara
Santa Cruz	Lake	Santa Clara
Toad, Arroyo Southwestern	Los Angeles	Santa Cruz
<i>Bufo californicus (=microscaphus)</i>	Marin	Sonoma
Imperial	Mendocino	Ventura
Los Angeles	Monterey	

Bird

Rail, California Clapper
Rallus longirostris obsoletus

Alameda
 Contra Costa
 Marin
 Monterey
 Napa
 San Luis Obispo
 San Mateo
 Santa Clara
 Solano
 Sonoma

Rail, Light-footed Clapper
Rallus longirostris levipes

Los Angeles
 Orange
 San Diego
 Santa Barbara
 Ventura

Rail, Yuma Clapper
Rallus longirostris yumanensis

Imperial
morroensis
 Riverside
 San Bernardino

Shrike, San Clemente Loggerhead
Lanius ludovicianus meamsi
 Los Angeles

Sparrow, San Clemente Sage
Amphispiza belli clementae
 Los Angeles
cascus)

Tern, California Least
Sterna antillarum browni
 Alameda
 Contra Costa
 Los Angeles
 Monterey
 Orange
 San Diego
 San Luis Obispo
 San Mateo
 Santa Barbara
 Santa Clara
 Ventura
pacificus

Bird

Towhee, Inyo Brown
Pipilo crissalis eremophilus

Inyo
 Vireo, Least Bell's
Vireo bellii pusillus
 Inyo
 Kern
 Los Angeles
 Monterey
 Orange
 Riverside
 San Bernardino
 San Diego
 San Luis Obispo
 Santa Barbara
 Ventura

Mammal

Fox, San Joaquin Kit
Vulpes macrotis mutica

Alameda
 Contra Costa
 Fresno
 Kern
 Kings
 Madera
 Merced
 Monterey
 Orange
 Riverside
 San Bernardino
 San Diego
 San Luis Obispo
 Santa Barbara
 Tulare

Napa
 San Benito
 San Joaquin

San Luis Obispo
 Santa Barbara
 Santa Clara
 Stanislaus
 Tipton
 Tularc
 Fox, San Miguel Island
Urocyon littoralis littoralis
 Santa Barbara
 Fox, Santa Catalina Island
Urocyon littoralis catalinae
 Los Angeles
 Fox, Santa Cruz Island
Urocyon littoralis santacruzae

Santa Barbara

Mammal

Fox, Santa Rosa Island
Urocyon littoralis santarosae

Santa Barbara
 Kangaroo Rat, Fresno
Dipodomys nitratoides exilis

Fresno
 Kings
 Madera
 Merced
 Kangaroo Rat, Giant
Dipodomys ingens
 Fresno
 Kern
 Kings
 Merced
 Monterey
 Orange
 Riverside
 San Bernardino
 San Diego
 San Luis Obispo
 Santa Barbara
 Tulare

Kangaroo Rat, Morro Bay
Dipodomys heermanni

San Luis Obispo
 Kangaroo Rat, San Bernardino
 Merriam's
Dipodomys merriami parvus
 Riverside
 San Bernardino

Kangaroo Rat, Stephens'
Dipodomys stephensi (incl. D.

Riverside

San Bernardino
 San Diego
 Kangaroo Rat, Tipton
Dipodomys nitratoides nitratoides
 Kern
 Kings
 Tulare
 Mountain Beaver, Point Arena
Aplodontia rufa nigra
 Mendocino
 Mouse, Pacific Pocket
Perognathus longimembris

Los Angeles

Mammal

Orange
San Diego
Mouse, Salt Marsh Harvest
Reithrodontomys raviventris
Alameda
Contra Costa
Marin
Napa
San Mateo
Santa Clara
Solano
Sonoma
Rabbit, Riparian Brush
Sylvilagus bachmani riparius
San Joaquin
Sheep, Peninsular Bighorn
Ovis canadensis
Imperial
Inyo
Mono
Riverside
San Diego
Sheep, Sierra Nevada Bighorn
Ovis canadensis californiana
Inyo
Mono
San Diego
Shrew, Buena Vista Lake Ornate
Sorex omatus relictus
Kern
Vole, Amargosa
Microtus californicus scirpensis
Inyo
San Bernardino
Woodrat, Riparian
Neotoma fuscipes riparia
San Joaquin

Reptile

Lizard, Blunt-nosed Leopard
Gambelia silus
Fresno
Kern
Kings
Los Angeles
Madera
Merced
San Benito
San Luis Obispo
Santa Barbara
Tulare
Ventura
Lizard, Coachella Valley Fringe-toed
Uma inornata
Riverside
Lizard, Island Night
Xantusia riversiana
Los Angeles
Santa Barbara
Ventura
Sea turtle, olive ridley
Lepidochelys olivacea
Humboldt
Mendocino
Monterey
San Diego
Snake, Giant Garter
Thamnophis gigas
Butte
Colusa
Fresno
Glenn
Merced
Sacramento
San Joaquin
Sutter
Yolo
Snake, San Francisco Garter
Thamnophis sirtalis tetrataenia
San Mateo
Santa Cruz
Tortoise, Desert
Gopherus agassizii
Imperial
Inyo
Kern
Los Angeles
Riverside
San Bernardino

Reptile

Whipsnake (=Striped Racer),
Masticophis lateralis euryxanthus
Alameda
Contra Costa

Colorado

Bird

Crane, Whooping
Grus americana
Weld
Owl, Mexican Spotted
Strix occidentalis lucida

Archuleta
Conejos
Dolores
El Paso
Fremont
Huerfano
La Plata
Moffat
Montezuma
Montrose
Ouray
Pueblo
Rio Grande
Saguache

Mammal

Ferret, Black-footed
Mustela nigripes
Archuleta
Conejos
Costilla
Delta
Dolores
Garfield
La Plata
Mesa
Moffat
Montezuma

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Page 6 of 49

<u>Mammal</u>	<u>Reptile</u>	<u>Bird</u>
Saguache	Turtle, Bog (Northern population)	Collier
Mouse, Preble's Meadow Jumping	<i>Clemmys muhlenbergii</i>	Dade
<i>Zapus hudsonius preblei</i>	New Castle	Glades
Boulder		Hendry
Douglas		Highlands
El Paso		Indian River
Elbert		Lake
Jefferson		Lee
Larimer		Marion
Weld		Martin
Connecticut	Florida	Okeechobee
Bird	Amphibian	Orange
Plover, Piping	Salamander, Flatwoods	Osceola
<i>Charadrius melanotos</i>	<i>Ambystoma cingulatum</i>	Palm Beach
Fairfield	Baker	Polk
Middlesex	Bradford	Sumter
New Haven	Calhoun	Volusia
New London	Holmes	
Tern, Roseate	Jackson	
<i>Sterna dougallii dougallii</i>	Jefferson	
New Haven	Liberty	
Mammal	Okaloosa	
Bat, Indiana	Santa Rosa	
<i>Myotis sodalis</i>	Wakulla	
Litchfield	Walton	
Middlesex	Washington	
Windham		
Reptile	Bird	
Turtle, Bog (Northern population)	Caracara, Audubon's Crested	
<i>Clemmys muhlenbergii</i>	<i>Polyborus plancus audubonii</i>	
Fairfield	Brevard	
Litchfield	Charlotte	
Delaware	Collier	
Bird	De Soto	
Plover, Piping	Glades	
<i>Charadrius melanotos</i>	Hardee	
Sussex	Hendry	
Mammal	Highlands	
Squirrel, Delmarva Peninsula Fox	Indian River	
<i>Sciurus niger cinereus</i>	Manatee	
Sussex	Martin	
Reptile	Okeechobee	
	Orange	
	Osceola	
	Palm Beach	
	Polk	
	Sarasota	
	Kite, Everglade Snail	
	<i>Rostrhamus sociabilis plumbeus</i>	
	Broward	Scrub-Jay, Florida
	Citrus	<i>Aphelocoma coerulescens</i>
		Alachua

<u>Bird</u>	<u>Bird</u>	<u>Bird</u>
Brevard	Okeechobee	Marion
Charlotte	Osceola	Martin
Citrus	Polk	Nassau
Clay	Stork, Wood	Okaloosa
Collier	<i>Mycteria americana</i>	Okeechobee
De Soto	Alachua	Orange
Dixie	Baker	Osceola
Flagler	Bay	Palm Beach
Gilchrist	Bradford	Pasco
Glades	Brevard	Pinellas
Hardee	Broward	Polk
Hendry	Calhoun	Putnam
Hernando	Charlotte	Santa Rosa
Highlands	Citrus	Sarasota
Hillsborough	Clay	Seminole
Indian River	Collier	St. Johns
Lake	Columbia	Sumter
Lee	Dade	Suwannee
Levy	De Soto	Taylor
Manatee	Dixie	Union
Marion	Duval	Volusia
Martin	Escambia	Wakulla
Okeechobee	Flagler	Walton
Orange	Gadsden	Washington
Osceola	Gilchrist	Woodpecker, Red-cockaded
Palm Beach	Glades	<i>Picoides borealis</i>
Pasco	Hamilton	Alachua
Pinellas	Hardee	Baker
Polk	Hendry	Bay
Putnam	Hernando	Bradford
Sarasota	Highlands	Brevard
Seminole	Hillsborough	Broward
St. Johns	Holmes	Charlotte
Sumter	Indian River	Citrus
Volusia	Jackson	Clay
Sparrow, Cape Sable Seaside	Jefferson	Collier
<i>Ammodramus maritimus mirabilis</i>	Lafayette	Columbia
Collier	Lake	Dade
Dade	Lee	Dixie
Sparrow, Florida Grasshopper	Leon	Duval
<i>Ammodramus savannarum floridanus</i>	Levy	Escambia
Dade	Liberty	Flagler
Glades	Madison	Gilchrist
Highlands	Manatee	Glades

<u>Bird</u>	<u>Mammal</u>	<u>Reptile</u>
Hamilton	Jackson	Brevard
Hardee	Bat, Indiana	Broward
Hendry	<i>Myotis sodalis</i>	Charlotte
Hernando	Jackson	Citrus
Highlands	Mouse, Anastasia Island Beach	Collier
Hillsborough	<i>Peromyscus polionotus phasma</i>	Dade
Holmes	St. Johns	Dixie
Indian River	Mouse, Choctawhatchee Beach	Duval
Jackson	<i>Peromyscus polionotus allophrys</i>	Escambia
Lafayette	Bay	Flagler
Lake	Walton	Hernando
Lee	Mouse, Perdido Key Beach	Hillsborough
Leon	<i>Peromyscus polionotus trissyllepsis</i>	Indian River
Levy	Escambia	Lee
Liberty	Mouse, Southeastern Beach	Levy
Madison	<i>Peromyscus polionotus niveiventris</i>	Manatee
Manatee	Brevard	Martin
Marion	Indian River	Nassau
Martin	Panther, Florida	Okaloosa
Nassau	<i>Puma (=Felis) concolor coryi</i>	Palm Beach
Okaloosa	Broward	Pasco
Okeechobee	Charlotte	Pinellas
Orange	Collier	Santa Rosa
Osceola	Dade	Sarasota
Palm Beach	Glades	St. Johns
Pasco	Hendry	Taylor
Pinellas	Highlands	Volusia
Polk	Lee	Walton
Putnam	Osceola	Sea turtle, hawksbill
Santa Rosa	Palm Beach	<i>Eretmochelys imbricata</i>
Sarasota	Polk	Brevard
Seminole	Vole, Florida Salt Marsh	Broward
St. Johns	<i>Microtus pennsylvanicus</i>	Dade
Sumter	Levy	Duval
Suwannee	<u>Reptile</u>	Flagler
Taylor	Crocodile, American	Martin
Union	<i>Crocodylus acutus</i>	Nassau
Volusia	Broward	Palm Beach
Wakulla	Collier	Palm Beach
Walton	Dade	Pasco
Washington	Lee	Pasco
<u>Mammal</u>	Sea turtle, green	St. Johns
Bat, Gray	<i>Chelonia mydas</i>	St. Johns
<i>Myotis grisescens</i>	Bay	Volusia
		Volusia

<u>Reptile</u>	<u>Reptile</u>	<u>Reptile</u>
Pasco	Duval	Bradford
Pinellas	Escambia	Brevard
Volusia	Flagler	Broward
Sea turtle, leatherback	Hernando	Calhoun
<i>Dermochelys coriacea</i>	Hillsborough	Charlotte
Bay	Indian River	Citrus
Brevard	Lee	Clay
Broward	Levy	Collier
Charlotte	Manatee	Columbia
Citrus	Martin	Dade
Collier	Nassau	De Soto
Dade	Okaloosa	Dixie
Dixie	Palm Beach	Duval
Duval	Pasco	Escambia
Escambia	Pinellas	Flagler
Flagler	Santa Rosa	Gadsden
Hernando	Sarasota	Gilchrist
Hillsborough	St. Johns	Glades
Indian River	Taylor	Hamilton
Lee	Volusia	Hardee
Levy	Walton	Hendry
Manatee	Skink, Blue-tailed Mole	Hernando
Martin	<i>Eumeces egregius lividus</i>	Highlands
Nassau	Highlands	Hillsborough
Okaloosa	Osceola	Holmes
Palm Beach	Polk	Indian River
Pasco	Skink, Sand	Jackson
Pinellas	<i>Neoseps reynoldsi</i>	Jefferson
Santa Rosa	Highlands	Lafayette
Sarasota	Lake	Lake
St. Johns	Marion	Lee
Taylor	Orange	Leon
Volusia	Osceola	Levy
Walton	Polk	Liberty
Sea turtle, loggerhead	Snake, Atlantic Salt Marsh	Madison
<i>Caretta caretta</i>	<i>Nerodia clarkii taeniata</i>	Manatee
Bay	Brevard	Marion
Brevard	Indian River	Martin
Broward	Volusia	Nassau
Charlotte	Snake, Eastern Indigo	Okaloosa
Citrus	<i>Drymarchon corais couperi</i>	Okeechobee
Collier	Alachua	Orange
Dade	Baker	Osceola
Dixie	Bay	Palm Beach

<u>Reptile</u>	<u>Bird</u>	<u>Bird</u>
Pasco	Ben Hill	Lee
Pinellas	Berrien	Liberty
Polk	Bibb	Long
Putnam	Bleckley	Lowndes
Santa Rosa	Brantley	Macon
Sarasota	Brooks	Marion
Seminole	Bryan	McDuffie
St. Johns	Bulloch	McIntosh
Sumter	Burke	Miller
Suwannee	Calhoun	Mitchell
Taylor	Camden	Montgomery
Union	Candler	Muscogee
Volusia	Charlton	Peach
Wakulla	Chatham	Pierce
Walton	Clay	Pulaski
Washington	Clinch	Quitman
Georgia	Coffee	Randolph
	Colquitt	Richmond
	Columbia	Schley
	Cook	Screven
	Crawford	Seminole
	Crisp	Stewart
	Decatur	Sumter
	Dodge	Talbot
	Dooly	Tattnall
	Dougherty	Taylor
	Early	Telfair
	Echols	Terrell
	Effingham	Thomas
	Emanuel	Tift
	Evans	Toombs
	Floyd	Treutlen
	Glynn	Turner
	Grady	Twiggs
	Hancock	Ware
	Houston	Warren
	Irwin	Washington
	Jeff Davis	Wayne
	Jefferson	Webster
	Jenkins	Wheeler
	Johnson	Wilcox
	Jones	Wilkinson
	Lanier	Worth
	Laurens	

<u>Bird</u>	<u>Bird</u>	<u>Bird</u>
Warbler (=Wood), Kirtland's	Crawford	Lincoln
<i>Dendroica kirtlandii</i>	Crisp	Long
Bryan	Decatur	Lowndes
Camden	Dodge	Macon
Chatham	Dooly	Madison
Glynn	Dougherty	Marion
Liberty	Douglas	McIntosh
Long	Early	Meriwether
McIntosh	Echols	Miller
Woodpecker, Red-cockaded	Effingham	Mitchell
<i>Picoides borealis</i>	Elbert	Monroe
Appling	Emanuel	Montgomery
Atkinson	Evans	Morgan
Bacon	Fayette	Muscogee
Baker	Floyd	Newton
Baldwin	Forsyth	Oconee
Banks	Franklin	Oglethorpe
Barrow	Fulton	Paulding
Ben Hill	Glynn	Peach
Berrien	Grady	Pierce
Bibb	Greene	Pike
Bleckley	Gwinnett	Pulaski
Brantley	Habersham	Putnam
Brooks	Hall	Quitman
Bryan	Hancock	Randolph
Bulloch	Haralson	Richmond
Burke	Harris	Rockdale
Butts	Hart	Schley
Calhoun	Heard	Screven
Camden	Henry	Seminole
Candler	Houston	Spalding
Carroll	Irwin	Stephens
Catoosa	Jackson	Stewart
Charlton	Jasper	Sumter
Chatham	Jeff Davis	Talbot
Clay	Jefferson	Taliaferro
Clayton	Jenkins	Tattnall
Clinch	Johnson	Taylor
Cobb	Jones	Telfair
Coffee	Lamar	Terrell
Colquitt	Lanier	Thomas
Columbia	Laurens	Tift
Cook	Lee	Toombs
Coweta	Liberty	Treutlen

<u>Bird</u>	<u>Mammal</u>	<u>Mammal</u>
Troup	Butts	Paulding
Turner	Calhoun	Pickens
Twiggs	Carroll	Pike
Upson	Catoosa	Polk
Walton	Chattooga	Quitman
Ware	Cherokee	Rabun
Warren	Clay	Randolph
Washington	Clayton	Rockdale
Wayne	Cobb	Schley
Webster	Coweta	Seminole
Wheeler	Crawford	Spalding
Whitfield	Dade	Stephens
Wilcox	Dawson	Stewart
Wilkes	De Kalb	Talbot
Wilkinson	Douglas	Terrell
Worth	Early	Towns
<u>Mammal</u>		
Bat, Gray	Fannin	Troup
<i>Myotis grisescens</i>	Fayette	Union
Bartow	Floyd	Upson
Butts	Forsyth	Walker
Catoosa	Fulton	Walton
Chattooga	Gilmer	Webster
Cherokee	Gordon	White
Dade	Gwinnett	Whitfield
De Kalb	Habersham	Bat, Virginia Big-eared
<i>townsendii</i>	Hall	<i>Corynorhinus (=Plecotus)</i>
Fannin	Haralson	<i>virginianus</i>
Floyd	Harris	Clinch
Gilmer	Heard	<u>Reptile</u>
Gordon	Henry	Sea turtle, loggerhead
Gwinnett	Jackson	<i>Caretta caretta</i>
Haralson	Jasper	Bryan
Murray	Lamar	Camden
Paulding	Lumpkin	Chatham
Pickens	Madison	Glynn
Polk	Marion	Liberty
Upson	Meriwether	Marion
Walker	Miller	Snake, Eastern Indigo
Whitfield	Monroe	<i>Drymarchon corais couperi</i>
	Morgan	Appling
Bat, Indiana	Murray	Atkinson
<i>Myotis sodalis</i>	Muscogee	Bacon
Banks	Newton	Baker
Barrow	Oconee	Ben Hill

<u>Reptile</u>	<u>Reptile</u>	<u>Bird</u>
Berrien	Miller	Albatross, Short-tailed
Bibb	Mitchell	<i>Phoebastria</i> (= <i>Diomedea</i>)
<i>albatrus</i>		
Bleckley	Montgomery	Honolulu
Brantley	Pierce	Coot, Hawaiian (=Aiae keo keo)
Brooks	Pulaski	<i>Fulica americana alai</i>
Bryan	Quitman	Hawaii
Bulloch	Randolph	Honolulu
Burke	Screven	Kauai
Calhoun	Seminole	Maui
Camden	Stewart	Creeper, Hawaii
Candler	Sumter	<i>Oreomystis mana</i>
Charlton	Tattnall	Hawaii
Chatham	Taylor	Creeper, Molokai (Kakawahie)
Clay	Telfair	<i>Paroreomyza flammea</i>
Clinch	Terrell	Maui
Coffee	Thomas	Creeper, Oahu (Alauwahio)
Colquitt	Tift	<i>Paroreomyza maculata</i>
Cook	Toombs	Honolulu
Crawford	Treutlen	Crow, Hawaiian ('Alala)
Crisp	Turner	<i>Corvus hawaiiensis</i>
Decatur	Twiggs	Hawaii
Dodge	Ware	Duck, Hawaiian (Koloa)
Dooly	Washington	<i>Anas wyvilliana</i>
Dougherty	Wayne	Hawaii
Early	Webster	Honolulu
Echols	Wheeler	Kauai
Effingham	Wilcox	Duck, Laysan
Emanuel	Worth	<i>Anas laysanensis</i>
Evans		Honolulu
Glynn		Elepaio, Oahu
Grady		Elepaio, Oahu
Houston	'Akepa, Hawaii	<i>Chasiempis sandwichensis ibidis</i>
Irwin	<i>Loxops coccineus coccineus</i>	Honolulu
Jeff Davis	Hawaii	
Jenkins	'Akepa, Maui	Finch, Laysan
Johnson	<i>Loxops coccineus ochraceus</i>	<i>Telespyza cantans</i>
Lanier	Maui	Honolulu
Laurens	'Akia Loa, Kauai (<i>Hemignathus procerus</i>)	Finch, Nihoa
Lee	<i>Hemignathus procerus</i>	<i>Telespyza ultima</i>
Liberty	Kauai	Honolulu
Long	'Akia Pola'au (<i>Hemignathus munroi</i>)	Honolulu
Lowndes	<i>Hemignathus munroi</i>	Goose, Hawaiian (Nene)
Macon		<i>Branta</i> (= <i>Nesochen</i>) <i>sandvicensis</i>
Marion	Hawaii	<i>Branta</i> (= <i>Nesochen</i>) <i>sandvicensis</i>
		Hawaii
		Hawaii
		Kauai
		Maui
		Maui

<u>Bird</u>	<u>Bird</u>	<u>Bird</u>
Hawk, Hawaiian (Io)	Hawaii	Caribou
<i>Buteo solitarius</i>	Honolulu	<u>Mammal</u>
Hawaii	Kauai	Bear, Grizzly
Honeycreeper, Crested ('Akohokohe)	Stilt, Hawaiian (=Ae'o)	<i>Ursus arctos horribilis</i>
<i>Palmeria dolei</i>	<i>Himantopus mexicanus knudseni</i>	Bonner
Maui	Hawaii	Boundary
Kauai creeper	Honolulu	Clearwater
<i>Oreomystis bairdi</i>	Kauai	Fremont
Kauai	Maui	Idaho
Millerbird, Nihoa	Thrush, Large Kauai	Shoshone
<i>Acrocephalus familiaris kingi</i>	<i>Myadestes myadestinus</i>	Teton
Honolulu	Kauai	Caribou, Woodland
Moorhen, Hawaiian Common	Thrush, Molokai (Oloma'o)	<i>Rangifer tarandus caribou</i>
<i>Gallinula chloropus sandvicensis</i>	<i>Myadestes lanaiensis rutha</i>	Bonner
Honolulu	Maui	Boundary
Kauai	Thrush, Small Kauai (Puaoahi)	Squirrel, Northern Idaho Ground
Maui	<i>Myadestes palmeri</i>	<i>Spermophilus brunneus brunneus</i>
Nuku Pu'u	Kauai	Adams
<i>Hemignathus lucidus</i>	<u>Mammal</u>	Illinois
Kauai	Bat, Hawaiian Hoary	<u>Bird</u>
Maui	<i>Lasiurus cinereus semotus</i>	Plover, Piping
'O'o, Kauai ('A'a)	Hawaii	<i>Charadrius melanotos</i>
<i>Moho braccatus</i>	Honolulu	Cook
Kauai	Kauai	Lake
'O'u (Honeycreeper)	Maui	Tern, Interior (population) Least
<i>Psittirostra psittacea</i>	<u>Reptile</u>	<i>Sterna antillarum</i>
Hawaii	Sea turtle, green	Alexander
	<i>Chelonia mydas</i>	Gallatin
Kauai	Hawaii	Hardin
Palila	Honolulu	Jackson
<i>Loxioides bailleui</i>	Kauai	Madison
Hawaii	Maui	Massac
Parrotbill, Maui	Sea turtle, hawksbill	Pope
<i>Pseudonestor xanthophrys</i>	<i>Eretmochelys imbricata</i>	Pulaski
Maui	Hawaii	Wabash
Petrel, Hawaiian Dark-rumped	Honolulu	White
<i>Pterodroma phaeopygia sandwichensis</i>	Kauai	<u>Mammal</u>
Hawaii	Maui	Bat, Gray
Kauai		Bat, Gray
Maui		<i>Myotis grisescens</i>
Po'ouli	<u>Idaho</u>	Alexander
<i>Melamprosops phaeosoma</i>	<u>Bird</u>	Hardin
Maui	Crane, Whooping	Johnson
Shearwater, Newell's Townsend's	<i>Grus americana</i>	Madison
<i>Puffinus auricularis newelli</i>	Bonneville	

Mammal

Pike
Pope
Pulaski
Bat, Indiana
Myotis sodalis
Adams
Alexander
Bond
Boone
Brown
Bureau
Calhoun
Carroll
Cass
Champaign
Christian
Clark
Clay
Clinton
Coles
Cook
Crawford
Cumberland
De Kalb
De Witt
Douglas
Du Page
Edgar
Edwards
Effingham
Fayette
Ford
Franklin
Fulton
Gallatin
Greene
Grundy
Hamilton
Hancock
Hardin
Henderson
Henry
Iroquois
Jackson

Mammal

Jasper
Jefferson
Jersey
Jo Daviess
Johnson
Kane
Kankakee
Kendall
Knox
La Salle
Lake
Lawrence
Lee
Livingston
Logan
Macon
Macoupin
Madison
Marion
Marshall
Mason
Massac
McDonough
Menard
Mercer
Monroe
Montgomery
Morgan
Moultrie
Ogle
Peoria
Perry
Piatt
Pike
Pope
Pulaski
Putnam
Randolph
Richland
Rock Island
Saline
Sangamon
Schuyler
Scott

Mammal

Shelby
St. Clair
Stark
Stephenson
Tazewell
Union
Vermilion
Wabash
Warren
Washington
Wayne
Whiteside
Williamson
Winnebago
Woodford

Indiana**Bird**

Plover, Piping
Charadrius melanotos
Porter
Tern, Interior (population) Least
Sterna antillarum
Gibson

Mammal

Bat, Gray
Myotis grisescens
Clark
Floyd
Harrison
Jennings
Perry
Spencer
Bat, Indiana
Myotis sodalis
Adams
Allen
Bartholomew
Benton
Blackford
Boone
Brown
Carroll
Cass

<u>Mammal</u>	<u>Mammal</u>	<u>Reptile</u>
Clark	Montgomery	Steuben
Clay	Morgan	Iowa
Clinton	Newton	
Crawford	Noble	<u>Bird</u>
Daviess	Ohio	Plover, Piping
De Kalb	Orange	<i>Charadrius melanotos</i>
Dearborn	Owen	Polk
Decatur	Parke	Pottawattamie
Delaware	Perry	Woodbury
Dubois	Pike	Tern, Interior (population) Least
Elkhart	Porter	<i>Sterna antillarum</i>
Fayette	Posey	Pottawattamie
Floyd	Pulaski	Woodbury
Fountain	Putnam	<u>Mammal</u>
Franklin	Randolph	Bat, Indiana
Fulton	Ripley	<i>Myotis sodalis</i>
Gibson	Rush	Adair
Grant	Scott	Adams
Greene	Shelby	Appanoose
Hamilton	Spencer	Cass
Hancock	St. Joseph	Cedar
Harrison	Starke	Clarke
Hendricks	Steuben	Dallas
Henry	Sullivan	Davis
Howard	Switzerland	Decatur
Huntington	Tippecanoe	Des Moines
Jackson	Tipton	Dubuque
Jasper	Union	Fremont
Jay	Vanderburgh	Guthrie
Jefferson	Vermillion	Harrison
Jennings	Vigo	Henry
Johnson	Wabash	Iowa
Knox	Warren	Jasper
Kosciusko	Warrick	Jefferson
La Porte	Washington	Johnson
Lagrange	Wayne	Keokuk
Lake	Wells	Lee
Lawrence	White	Louisa
Madison	Whitley	Lucas
Marion		Madison
Marshall		Mahaska
Martin		Marion
Miami		Mills
Monroe		Monroe

Mammal

Montgomery
Muscatine
Page
Polk
Pottawattamie
Poweshiek
Ringgold
Scott
Taylor
Union
Van Buren
Wapello
Warren
Washington
Wayne

Kansas**Bird**

Crane, Whooping
Grus americana
Barber
Barton
Chase
Cheyenne
Clark
Clay
Cloud
Coffey
Comanche
Cowley
Decatur
Dickinson
Douglas
Edwards
Ellis
Ellsworth
Finney
Ford
Gove
Graham
Gray
Greenwood
Harper
Harvey

Bird

Haskell
Hodgeman
Jefferson
Jewell
Kearny
Kingman
Lane
Lincoln
Logan
Marion
Marshall
McPherson
Meade
Mitchell
Ness
Norton
Osage
Osborne
Ottawa
Pawnee
Phillips
Pratt
Rawlins
Reno
Republic
Rice
Riley
Rooks
Rush
Russell
Saline
Scott
Sedgwick
Seward
Shawnee
Sheridan
Sherman
Smith
Stafford
Sumner
Thomas
Trego
Wabaunsee
Wallace

Bird

Washington
Wichita
Plover, Piping
Charadrius melanotos
Barton
Clark
Comanche
Cowley
Edwards
Finney
Ford
Gray
Hamilton
Kearny
Meade
Pawnee
Phillips
Reno
Rice
Sedgwick
Stafford
Sumner
Tern, Interior (population) Least
Stena antillarum
Barton
Clark
Comanche
Cowley
Edwards
Finney
Ford
Gray
Hamilton
Kearny
Meade
Pawnee
Phillips
Reno
Rice
Sedgwick
Stafford
Sumner

Mammal

Mammal

Bat, Gray
Myotis grisescens
 Bourbon
 Cherokee
 Crawford
 Labette
 Ferret, Black-footed
Mustela nigripes
 Cheyenne
 Clark
 Comanche
 Decatur
 Finney
 Ford
 Gove
 Graham
 Grant
 Gray
 Greeley
 Hamilton
 Haskell
 Hodgeman
 Kearny
 Lane
 Logan
 Morton
 Ness
 Norton
 Rawlins
 Scott
 Sedgwick
 Sheridan
 Sherman
 Stanton
 Stevens
 Thomas
 Trego
 Wallace
 Wichita

Kentucky

Bird

Plover, Piping
Charadrius melanotos

Bird

Jefferson
 Tern, Interior (population) Least
Sterna antillarum
 Ballard
 Carlisle
 Fulton
 Hickman
 Jefferson
 Livingston
 McCracken
 Union
 Warbler (=Wood), Kirtland's
Dendroica kirtlandii
 Boyle
 Warren
 Warbler, Bachman's
Vermivora bachmanii
 Edmonson
 Logan
 Warren
 Woodpecker, Ivory-billed
Campephilus principalis
 Ballard
 Fulton
 Lewis
 Lincoln
 Woodpecker, Red-cockaded
Picoides borealis
 Bell
 Clinton
 Edmonson
 Laurel
 Mason
 McCreary
 Muhlenberg
 Powell
 Pulaski
 Russell
 Wayne
 Whitley
 Wolfe

Mammal

Bat, Gray
Myotis grisescens

Mammal

Adair
 Allen
 Barren
 Breckinridge
 Bullitt
 Caldwell
 Calloway
 Carter
 Christian
 Clark
 Clinton
 Crittenden
 Edmonson
 Fayette
 Franklin
 Garrard
 Graves
 Grayson
 Green
 Greenup
 Hardin
 Hart
 Hopkins
 Jefferson
 Jessamine
 Larue
 Lee
 Livingston
 Logan
 Meade
 Menifee
 Metcalfe
 Monroe
 Muhlenberg
 Nelson
 Pulaski
 Simpson
 Taylor
 Todd
 Trigg
 Warren
 Wayne
 Whitley

<u>Mammal</u>	<u>Mammal</u>	<u>Mammal</u>
Bat, Indiana	Grayson	Nicholas
<i>Myotis sodalis</i>	Greenup	Ohio
Adair	Hancock	Oldham
Allen	Hardin	Owen
Anderson	Harrison	Owsley
Ballard	Hart	Pendleton
Barren	Henderson	Perry
Bath	Henry	Pike
Bell	Hickman	Powell
Boone	Hopkins	Pulaski
Bourbon	Jackson	Robertson
Boyd	Jefferson	Rockcastle
Boyle	Jessamine	Rowan
Bracken	Johnson	Russell
Breathitt	Kenton	Scott
Breckinridge	Knox	Shelby
Bullitt	Larue	Simpson
Butler	Laurel	Spencer
Caldwell	Lawrence	Taylor
Calloway	Lee	Todd
Campbell	Leslie	Trigg
Carlisle	Letcher	Trimble
Carroll	Lewis	Union
Carter	Lincoln	Warren
Casey	Livingston	Washington
Christian	Logan	Wayne
Clark	Lyon	Webster
Clay	Madison	Whitley
Clinton	Magoffin	Wolfe
Crittenden	Marion	Woodford
Cumberland	Marshall	Bat, Virginia Big-eared
Daviess	Martin	<i>Corynorhinus</i> (=Plecotus)
<i>townsendii</i>		
Edmonson	Mason	<i>virginianus</i>
Elliott	McCracken	Estill
Estill	McCreary	Jackson
Fayette	Meade	Lee
Fleming	Menifee	Menifee
Floyd	Mercer	Morgan
Franklin	Metcalfe	Powell
Fulton	Monroe	Rockcastle
Gallatin	Montgomery	Rowan
Garrard	Morgan	Wolfe
Grant	Muhlenberg	
Graves	Nelson	

Louisiana Bird

<u>Bird</u>	<u>Bird</u>	<u>Reptile</u>
Plover, Piping	Winn	LaFourche
<i>Charadrius melanotos</i>	<u>Mammal</u>	Terrebonne
Cameron	Bear, Louisiana Black	Vermilion
Iberia	<i>Ursus americanus luteolus</i>	Sea turtle, leatherback
Jefferson	Avoyelles	<i>Dermochelys coriacea</i>
LaFourche	Catahoula	Cameron
Terrebonne	Concordia	Iberia
Vermilion	East Carroll	Jefferson
Tern, California Least	Franklin	LaFourche
<i>Sterna antillarum browni</i>	Grant	Terrebonne
Madison	Iberia	Vermilion
Tern, Interior (population) Least	Iberville	Sea turtle, loggerhead
<i>Sterna antillarum</i>	Madison	<i>Caretta caretta</i>
Bossier	Pointe Coupee	Cameron
Caddo	Richland	Iberia
Concordia	St. Landry	Jefferson
East Carroll	St. Martin	LaFourche
Red River	St. Tammany	Terrebonne
Tensas	Tensas	Vermilion
Woodpecker, Red-cockaded	Vermilion	Tortoise, Gopher
<i>Picoides borealis</i>	Washington	<i>Gopherus polyphemus</i>
Allen	West Carroll	St. Tammany
Beauregard	West Feliciana	Tangipahoa
Bienville	<u>Reptile</u>	Washington
Bossier	Sea turtle, green	Turtle, Ringed Sawback
Calcasieu	<i>Chelonia mydas</i>	Turtle, Ringed Sawback
Claiborne	Cameron	<i>Graptemys oculifera</i>
De Soto	Jefferson	St. Tammany
Evangeline	LaFourche	Washington
Grant	Terrebonne	
Jackson	Vermilion	
La Salle	Sea turtle, hawksbill	Maine
Livingston	<i>Eretmochelys imbricata</i>	<u>Bird</u>
Morehouse	Cameron	<u>Bird</u>
Natchitoches	Iberia	Plover, Piping
Ouachita	Jefferson	<i>Charadrius melanotos</i>
Rapides	LaFourche	<i>Charadrius melanotos</i>
Red River	Terrebonne	Cumberland
Sabine	Vermilion	Sagadahoc
St. Tammany	Sea turtle, Kemp's ridley	York
Tangipahoa	<i>Lepidochelys kempii</i>	Tern, Roseate
Union	Cameron	<i>Sterna dougallii dougallii</i>
Vernon	Iberia	Hancock
Webster	Jefferson	Sagadahoc
		Washington
		Washington
		York

<u>Mammal</u>	<u>Bird</u>	<u>Bird</u>
Lynx, Canada <i>Lynx canadensis</i>	Dukes Essex Nantucket Plymouth	Schoolcraft Warbler (=Wood), Kirtland's <i>Dendroica kirtlandii</i>
Aroostook Piscataquis	Tern, Roseate <i>Sterna dougallii dougallii</i>	Alcona
Maryland	Barnstable Bristol Dukes Nantucket Plymouth	Baraga Chippewa
<u>Bird</u>		Clare Crawford Delta Grand Traverse
Plover, Piping <i>Charadrius melanotos</i>		Iosco
Worcester		Kalkaska
<u>Mammal</u>		Luce
Bat, Indiana <i>Myotis sodalis</i>	Bat, Indiana <i>Myotis sodalis</i>	Marquette
Allegany Frederick Garrett Harford	Berkshire	Montmorency
Howard Montgomery Washington	Turtle, Bog (Northern population) <i>Clemmys muhlenbergii</i>	Ogemaw Oscoda
Squirrel, Delmarva Peninsula Fox <i>Sciurus niger cinereus</i>	Berkshire	Otsego Presque Isle
Cecil Dorchester	Turtle, Plymouth Red-bellied <i>Pseudemys rubriventris bangsi</i>	Roscommon Schoolcraft
Kent Prince Georges Somerset Talbot Wicomico Worcester	Plymouth	Schoolcraft Wexford
<u>Reptile</u>		<u>Mammal</u>
Turtle, Bog (Northern population) <i>Clemmys muhlenbergii</i>		Bat, Indiana
Baltimore Carroll Cecil Harford		<i>Myotis sodalis</i>
Michigan	<u>Bird</u>	Allegan Barry Bay Benzie Berrien Branch Calhoun Cass Clinton Eaton Genesee Gratiot Hillsdale Huron Ingham Ionia Jackson Kalamazoo Kent
<u>Bird</u>	Plover, Piping <i>Charadrius melanotos</i>	
Plover, Piping <i>Charadrius melanotos</i>	Alger Alpena Benzie Berrien Charlevoix Cheboygan Chippewa Delta Emmet Huron Iosco Leelanau Luce Mackinac Mason Muskegon Presque Isle	
Barnstable Bristol		

<u>Mammal</u>	<u>Reptile</u>	<u>Bird</u>
Lapeer	Oakland	De Soto
Leelanau	St. Joseph	Issaquena
Lenawee		Tunica
Livingston		Warren
Macomb		Washington
Manistee	Plover, Piping	Woodpecker, Red-cockaded
Mason	<i>Charadrius melanotos</i>	<i>Picoides borealis</i>
Monroe	Marshall	Amite
Montcalm	St. Louis	Forrest
Muskegon	Traverse	Franklin
Oakland		George
Oceana	Lynx, Canada	Greene
Ottawa	<i>Lynx canadensis</i>	Harrison
Saginaw	Aitkin	Jackson
Sanilac	Beltrami	Jasper
Shiawassee	Carlton	Jones
St. Clair	Cass	Noxubee
St. Joseph	Clearwater	Oktibbeha
Tuscola	Cook	Perry
Van Buren	Itasca	Scott
Washtenaw	Koochiching	Smith
Wayne	Marshall	Stone
Lynx, Canada	Pine	Wayne
<i>Lynx canadensis</i>	Roseau	Wilkinson
Alger	St. Louis	Winston
Baraga		Yalobusha
Chippewa		
Delta		
Dickinson	<u>Mississippi</u>	<u>Mammal</u>
Houghton		
Iron		
Luce		
Mackinac	Frog, Dusky Gopher (Mississippi)	Bat, Gray
Marquette	<i>Rana capito sevosa</i>	<i>Myotis grisescens</i>
Menominee	Harrison	Perry
Ontonagon		Tishomingo
Schoolcraft		Wayne
<u>Reptile</u>	<u>Amphibian</u>	
Snake, Northern Copperbelly Water	Crane, Mississippi Sandhill	Bat, Indiana
<i>Nerodia erythrogaster neglecta</i>	<i>Grus canadensis pulla</i>	<i>Myotis sodalis</i>
Branch	Jackson	Tishomingo
Calhoun	Plover, Piping	Bear, Louisiana Black
Eaton	<i>Charadrius melanotos</i>	<i>Ursus americanus luteolus</i>
Hillsdale	Hancock	Adams
	Harrison	Amite
	Jackson	Attala
	Tern, Interior (population) Least	Claiborne
	<i>Sterna antillarum</i>	Clarke
	Bolivar	Copiah
	Coahoma	Covington

Mammal

Forrest
 Franklin
 George
 Greene
 Hancock
 Harrison
 Hinds
 Holmes
 Humphreys
 Issaquena
 Jackson
 Jasper
 Jefferson
 Jefferson Davis
 Jones
 Lamar
 Lauderdale
 Lawrence
 Leake
 Lowndes
 Madison
 Marion
 Neshoba
 Newton
 Pearl River
 Perry
 Pike
 Rankin
 Scott
 Sharkey
 Simpson
 Smith
 Stone
 Tunica
 Warren
 Washington
 Wayne
 Wilkinson
 Yazoo

Reptile

Sea turtle, Kemp's ridley
Lepidochelys kempii
 Hancock
 Harrison
 Jackson
 Sea turtle, loggerhead
Caretta caretta
 Hancock
 Harrison
 Jackson
 Snake, Eastern Indigo
Drymarchon corais couperi
 Forrest
 George
 Greene
 Harrison
 Jackson
 Jones
 Marion
 Perry
 Stone
 Wayne
 Tortoise, Gopher
Gopherus polyphemus
 Covington
 Forrest
 George
 Greene
 Hancock
 Harrison
 Jackson
 Jones
 Lamar
 Marion
 Pearl River
 Perry
 Stone
 Wayne
 Turtle, Ringed Sawback
Graptemys oculifera
 Copiah
 Hinds
 Lawrence
 Leake

Madison
 Marion
 Neshoba
 Pearl River
 Rankin
 Scott
 Simpson
 Turtle, Yellow-blotched Map
Graptemys flavimaculata
 Clarke
 Forrest
 George
 Greene
 Jackson
 Jones
 Perry
 Stone
 Wayne

Missouri

Bird

Plover, Piping
Charadrius melanotos
 Buchanan
 Holt
 Polk
 Tern, Interior (population) Least
Sturna antillarum
 Cape Girardeau
 Chariton
 Mississippi
 New Madrid
 Pemiscot
 Perry

Mammal

Bat, Gray
Myotis grisescens
 Barry
 Benton
 Boone
 Camden
 Carter
 Christian
 Cole

Mammal

Crawford
Dade
Dallas
Dent
Douglas
Franklin
Greene
Hickory
Iron
Jasper
Jefferson
La clede
Lawrence

Maries
Marion
McDonald
Miller
Morgan
Newton
Oregon
Osage
Ozark
Phelps
Pike
Pulaski
Ralls
Reynolds
St. Clair
St. Louis
Stone
Taney
Texas
Washington
Wright

Bat, Indiana
Myotis sodalis

Adair
Andrew
Atchison
Audrain
Barry
Boone
Buchanan
Caldwell

Mammal

Callaway
Camden
Carroll
Chariton
Christian
Clark
Clay
Clinton
Cooper
Crawford
Daviess
De Kalb
Franklin

Gentry
Grundy
Harrison
Henry
Holt
Howard
Iron
Jefferson
Knox
La clede
Lewis
Linn
Livingston
Macon
Marion
Mercer
Mississippi
Monroe
Montgomery
Nodaway
Oregon
Phelps
Pike

Platte
Pulaski
Ralls
Randolph
Ray
Schuyler
Scotland
St. Charles

Mammal

St. Francois
St. Louis
Stone
Sullivan
Taney
Texas
Warren
Washington
Worth
Wright

Montana**Bird**

Crane, Whooping
Grus americana
Dawson
Madison
Richland
Roosevelt
Sheridan

Plover, Piping
Charadrius melanotos
McCone
Phillips
Prairie
Richland
Roosevelt
Sheridan
Valley

Tern, Interior (population) Least
Sterna antillarum
McCone
Prairie
Richland
Roosevelt
Valley

Mammal
Bear, Grizzly
Ursus arctos horribilis
Carbon
Flathead
Gallatin
Glacier
Lake

<u>Mammal</u>	<u>Bird</u>	<u>Bird</u>
Lewis and Clark	Grant	Holt
Lincoln	Greeley	Howard
Madison	Hall	Kearney
Missoula	Harlan	Keith
Park	Hitchcock	Keya Paha
Pondera	Holt	Knox
Sanders	Hooker	Lincoln
Stillwater	Howard	Madison
Sweet Grass	Kearney	Merrick
Teton	Keya Paha	Nance
Yellowstone	Lincoln	Phelps
Ferret, Black-footed	Logan	Platte
<i>Mustela nigripes</i>	Loup	Polk
Big Horn	Nuckolls	Rock
Blaine	Perkins	Sarpy
Custer	Phelps	Saunders
Phillips	Red Willow	Sherman
Powder River	Rock	Stanton
Rosebud	Scotts Bluff	Valley
Treasure	Sheridan	Tern, Interior (population) Least
Nebraska	Sherman	<i>Stema antillarum</i>
Bird	Thomas	Boyd
Crane, Whooping	Valley	Brown
<i>Grus americana</i>	Webster	Buffalo
Adams	Wheeler	Butler
Arthur	Plover, Piping	Cass
Blaine	<i>Charadrius melanotos</i>	Cedar
Box Butte	Boyd	Colfax
Boyd	Brown	Cuming
Brown	Buffalo	Custer
Buffalo	Butler	Dawson
Cherry	Cass	Deuel
Clay	Cedar	Dixon
Custer	Cherry	Dodge
Dawson	Colfax	Douglas
Deuel	Cuming	Gosper
Dundy	Custer	Hall
Franklin	Dawson	Hamilton
Frontier	Dixon	Holt
Furnas	Dodge	Howard
Garden	Douglas	Kearney
Garfield	Gosper	Keith
Gosper	Hall	Keya Paha
	Hamilton	Knox

Bird		New Hampshire	Reptile
Lincoln			Warren
		Mammal	Warren
Madison		Bat, Indiana	New Mexico
Merrick			Amphibian
Nance			Amphibian
Phelps		<i>Myotis sodalis</i>	Frog, Chiricahua Leopard
Platte		Hillsborough	<i>Rana chiricahuensis</i>
Polk		Merrimack	Catron
Rock		Sullivan	Grant
Sarpy			Hidalgo
Saunders		New Jersey	Luna
Sherman		Bird	Sierra
Stanton		Curlew, Eskimo	
Valley		<i>Numenius borealis</i>	Socorro
Mammal		Cape May	Bird
Ferret, Black-footed		Plover, Piping	Crane, Whooping
<i>Mustela nigripes</i>		<i>Charadrius melanotos</i>	Crane, Whooping
Adams		Atlantic	<i>Grus americana</i>
Box Butte		Cape May	Bernalillo
Boyd		Monmouth	Quay
Buffalo		Ocean	Rio Arriba
Phelps			Sandoval
Red Willow		Mammal	Santa Fe
Scotts Bluff		Bat, Indiana	Sierra
Sheridan		<i>Myotis sodalis</i>	
Sherman		Bergen	Socorro
Sioux		Essex	Taos
Valley		Hunterdon	Taos
Webster		Mercer	Valencia
Nevada		Middlesex	Valencia
Bird		Morris	
Flycatcher, Southwestern Willow		Passaic	Falcon, Northern Aplomado
<i>Empidonax traillii extimus</i>		Somerset	<i>Falco femoralis septentrionalis</i>
Clark		Sussex	<i>Falco femoralis septentrionalis</i>
Rail, Yuma Clapper		Union	Chaves
<i>Rallus longirostris yumanensis</i>		Warren	Chaves
Clark			Dona Ana
Reptile		Reptile	Dona Ana
Tortoise, Desert		Turtle, Bog (Northern population)	Eddy
<i>Gopherus agassizii</i>		<i>Clemmys muhlenbergii</i>	Eddy
		Burlington	Grant
		Hunterdon	Hidalgo
		Monmouth	Lea
		Morris	Lea
			Lincoln
			Luna
			Otero
			Sierra
			Socorro
			Flycatcher, Southwestern Willow
			<i>Empidonax traillii extimus</i>
			Bernalillo

Clark
Lincoln
Nye

Ocean
Somerset
Sussex
Union

Catron
Cibola
Dona Ana
Grant

<u>Bird</u>	<u>Bird</u>	<u>Mammal</u>
Guadalupe	Catron	Socorro
Hidalgo	Chaves	Taos
Luna	Curry	Torrance
McKinley	De Baca	Union
Mora	Dona Ana	Valencia
Otero	Eddy	Jaguar
Rio Arriba	Otero	<i>Panthera onca</i>
San Juan	Quay	Hidalgo
San Miguel	Rio Arriba	<u>Reptile</u>
Sandoval	Socorro	Rattlesnake, New Mexican Ridge-
nosed		
Santa Fe	Mammal	<i>Crotalus willardi obscurus</i>
Sierra	Bat, Lesser (=Sanborn's) Long-nosed	Hidalgo
Socorro	<i>Leptonycteris curasoae yerbabuenae</i>	New York
Taos	Hidalgo	
Valencia	Bat, Mexican Long-nosed	<u>Bird</u>
Owl, Mexican Spotted	<i>Leptonycteris nivalis</i>	Plover, Piping
<i>Strix occidentalis lucida</i>	Hidalgo	<i>Charadrius melanotos</i>
Bernalillo	Ferret, Black-footed	Jefferson
Catron	<i>Mustela nigripes</i>	Nassau
Chaves	Bernalillo	Oswego
Cibola	Catron	Suffolk
Dona Ana	Chaves	Tern, Roseate
Eddy	Cibola	<i>Sterna dougallii dougallii</i>
Grant	Curry	Suffolk
Hidalgo	De Baca	Mammal
Lincoln	Dona Ana	Bat, Indiana
McKinley	Eddy	<i>Myotis sodalis</i>
Mora	Grant	Albany
Otero	Guadalupe	Allegany
Rio Arriba	Hidalgo	Broome
San Juan	Lea	Cattaraugus
San Miguel	Lincoln	Cayuga
Sandoval	Luna	Chautauqua
Santa Fe	McKinley	Chemung
Sierra	Mora	Chenango
Socorro	Otero	Columbia
Taos	Quay	Cortland
Torrance	Rio Arriba	Delaware
Valencia	Roosevelt	Dutchess
Plover, Piping	San Juan	Erie
<i>Charadrius melanotos</i>	San Miguel	Essex
Socorro	Sandoval	Franklin
Tern, Interior (population) Least	Santa Fe	Fulton
<i>Sterna antillarum</i>	Sierra	Genesee

Mammal

Greene
Hamilton
Herkimer
Jefferson
Lewis
Livingston
Madison
Monroe
Montgomery
Niagara
Oneida
Onondaga
Ontario
Orange
Orleans
Oswego
Otsego
Putnam
Queens
Rensselaer
Richmond
Rockland
Saratoga
Schenectady
Schoharie
Schuyler
Seneca
St. Lawrence
Steuben
Sullivan
Tioga
Tompkins
Ulster
Warren
Washington
Wayne
Westchester
Wyoming
Yates

Reptile

Turtle, Bog (Northern population)
Clemmys muhlenbergii
Columbia
Dutchess

Reptile

Orange
Oswego
Putnam
Seneca
North Carolina
Bird
Plover, Piping
Charadrius melanotos
Brunswick
Carteret
Currituck
Dare
Hyde
New Hanover
Onslow
Pamlico
Pender
Stork, Wood
Mycteria americana
Brunswick
Tern, Roseate
Sterna dougallii dougallii
Carteret
Dare
Woodpecker, Red-cockaded
Picoides borealis
Anson
Beaufort
Bertie
Bladen
Brunswick
Camden
Carteret
Chatham
Columbus
Craven
Cumberland
Currituck
Dare
Duplin
Edgecombe
Franklin
Gates

Bird

Greene
Halifax
Harnett
Hertford
Hoke
Hyde
Johnston
Jones
Lee
Lenoir
Montgomery
Moore
Nash
New Hanover
Northampton
Onslow
Orange
Pamlico
Pasquotank
Pender
Perquimans
Pitt
Randolph
Richmond
Robeson
Sampson
Scotland
Stanly
Tyrrell
Union
Wake
Washington
Wayne
Wilson

Mammal

Bat, Gray
Myotis grisescens
Buncombe
Haywood
Madison
Bat, Indiana
Myotis sodalis
Alexander
Alleghany

<u>Mammal</u>	<u>Reptile</u>	<u>Bird</u>
Ashe	Dare	Adams
Chowan	Hyde	Benson
Cleveland	Sea turtle, Kemp's ridley	Billings
Graham	<i>Lepidochelys kempii</i>	Bottineau
Jackson	Beaufort	Burke
Macon	Brunswick	Burleigh
Mitchell	Carteret	Dickey
Polk	Dare	Divide
Rutherford	Hyde	Dunn
Swain	Pamlico	Eddy
Wilkes	Sea turtle, leatherback	Emmons
Yancey	<i>Dermochelys coriacea</i>	Foster
Bat, Virginia Big-eared	Brunswick	Golden Valley
<i>Corynorhinus (=Plecotus) townsendii virginianus</i>	Carteret	Grant
Avery	Craven	Hettinger
Watauga	Currituck	Kidder
Yancey	Dare	La Moure
Squirrel, Carolina Northern Flying	Hyde	Logan
<i>Glaucomys sabrinus coloratus</i>	Onslow	Mercer
Avery	Sea turtle, loggerhead	Morton
Buncombe	<i>Caretta caretta</i>	Morton
Graham	Beaufort	MOUNTRAIL
Haywood	Bertie	Oliver
Jackson	Brunswick	Pierce
Madison	Camden	Renville
Martin	Carteret	Rolette
Mitchell	Chowan	Sheridan
Swain	Craven	Sioux
Transylvania	Currituck	Slope
Watauga	Dare	Stark
Yancey	Hyde	Stutsman
Reptile	New Hanover	Towner
Sea turtle, green	Onslow	Ward
<i>Chelonia mydas</i>	Pamlico	Wells
Brunswick	Pasquotank	Williams
Carteret	Pender	Plover, Piping
Dare	Perquimans	<i>Charadrius melanodus</i>
Hyde	Tyrrell	Benson
New Hanover	Washington	Burke
Onslow		Burleigh
Sea turtle, hawksbill		Divide
<i>Eretmochelys imbricata</i>		Dunn
Carteret		Eddy
		Emmons
		Kidder
North Dakota		
Bird		
Crane, Whooping		
<i>Grus americana</i>		

<u>Bird</u>	<u>Mammal</u>	<u>Mammal</u>
Logan	Bat, Indiana	Lake
McHenry	<i>Myotis sodalis</i>	Lawrence
McIntosh	Adams	Licking
McKenzie	Allen	Logan
McLean	Ashland	Lorain
Mercer	Ashtabula	Lucas
Morton	Athens	Madison
MOUNTRAIL	Auglaize	Mahoning
Oliver	Belmont	Marion
Pierce	Brown	Medina
Sheridan	Butler	Meigs
Sioux	Carroll	Mercer
Stutsman	Champaign	Miami
Ward	Clark	Montgomery
Williams	Clermont	Morgan
Tern, Interior (population) Least	Clinton	Morrow
<i>Stema antillarum</i>	Columbiana	Muskingum
Burleigh	Coshocton	Noble
Dunn	Crawford	Ottawa
Emmons	Cuyahoga	Paulding
Logan	Darke	Pickaway
Mercer	Defiance	Pike
Morton	Delaware	Portage
MOUNTRAIL	Erie	Preble
Oliver	Fairfield	Putnam
Sioux	Fayette	Richland
Ohio	Franklin	Ross
<u>Bird</u>	Fulton	Sandusky
Plover, Piping	Gallia	Scioto
<i>Charadrius melanotos</i>	Geauga	Seneca
Ashtabula	Greene	Shelby
Cuyahoga	Guernsey	Stark
Erie	Hamilton	Summit
Lake	Hancock	Trumbull
Lorain	Hardin	Tuscarawas
Lucas	Harrison	Union
Ottawa	Henry	Van Wert
Sandusky	Highland	Vinton
	Hocking	Warren
<u>Mammal</u>	Holmes	Washington
Bat, Gray	Huron	Wayne
<i>Myotis grisescens</i>	Jackson	Williams
Perry	Jefferson	Wood
	Knox	Wyandot

Reptile

Snake, Lake Erie Water
Nerodia sipedon insularum
 Erie
 Ottawa
 Snake, Northern Copperbelly Water
Nerodia erythrogaster neglecta
 Defiance
 Hardin
 Williams

Oklahoma

Bird

Crane, Whooping
Grus americana
 Alfalfa
 Beaver
 Beckham
 Blaine
 Caddo
 Canadian
 Carter
 Cleveland
 Comanche
 Cotton
 Custer
 Dewey
 Ellis
 Garfield
 Garvin
 Grady
 Grant
 Harmon
 Harper
 Jefferson
 Johnston
 Kingfisher
 Kiowa
 Lincoln
 Logan
 Love
 Major
 Marshall
 McClain
 Murray

Bird

Muskogee
 Noble
 Oklahoma
 Osage
 Pawnee
 Payne
 Roger Mills
 Rogers
 Stephens
 Texas
 Tillman
 Wagoner
 Washington
 Washita
 Woods
 Woodward
 Curlew, Eskimo
Numenius borealis
 Osage
 Woods
 Plover, Piping
Charadrius melanotos
 Alfalfa
 Atoka
 Beaver
 Blaine
 Bryan
 Caddo
 Canadian
 Carter
 Cherokee
 Choctaw
 Cleveland
 Comanche
 Cotton
 Creek
 Custer
 Delaware
 Dewey
 Ellis
 Garfield
 Grady
 Grant
 Harmon

Bird

Harper
 Haskell
 Hughes
 Jefferson
 Johnston
 Kay
 Kingfisher
 Latimer
 Le Flore
 Lincoln
 Logan
 Love
 Major
 Marshall
 Mayes
 McClain
 McCurtain
 McIntosh
 Muskogee
 Noble
 Nowata
 Oklahoma
 Osage
 Ottawa
 Pawnee
 Payne
 Pittsburg
 Pontotoc
 Pottawatomie
 Pushmataha
 Roger Mills
 Rogers
 Seminole
 Sequoyah
 Texas
 Tillman
 Tulsa
 Wagoner
 Washington
 Woods
 Woodward
 Tern, Interior (population) Least
Sterna antillarum
 Alfalfa

<u>Bird</u>	<u>Bird</u>	<u>Mammal</u>
Beaver	Sequoyah	Pittsburg
Blaine	Texas	Pushmataha
Bryan	Tillman	Sequoyah
Canadian	Tulsa	Wagoner
Choctaw	Wagoner	Bat, Ozark Big-eared
Cimarron	Woods	<i>Corynorhinus</i> (= <i>Plecotus</i>)
<i>townsendii</i>		
Cleveland	Woodward	<i>ingens</i>
Comanche	Vireo, Black-capped	Adair
Cotton	<i>Vireo atricapilla</i>	Cherokee
Creek	Beaver	Delaware
Custer	Blaine	Ottawa
Dewey	Caddo	Sequoyah
Ellis	Canadian	
Grady	Cleveland	
Harmon	Comanche	
Harper	Woodpecker, Red-cockaded	
Haskell	<i>Picoides borealis</i>	Murrelet, Marbled
Hughes	Bryan	<i>Brachyramphus marmoratus</i>
Jefferson	Latimer	<i>marmoratus</i>
Johnston	Le Flore	Baker
Kay	McCurtain	Curry
Kingfisher	Pittsburg	Douglas
Kiowa	Pushmataha	Lane
Le Flore		Lincoln
Logan		Polk
Love	<u>Mammal</u>	Tillamook
Major	Bat, Gray	Owl, Northern Spotted
Marshall	<i>Myotis grisescens</i>	Owl, Northern Spotted
McClain	Adair	<i>Strix occidentalis caurina</i>
McCurtain	Cherokee	Benton
McIntosh	Delaware	Clackamas
Murray	Ottawa	Clatsop
Muskogee		Columbia
Noble	Bat, Indiana	Coos
Oklahoma	<i>Myotis sodalis</i>	Coos
Osage	Adair	Curry
Pawnee	Cherokee	Douglas
Payne	Craig	Hood River
Pittsburg	Delaware	Jackson
Pontotoc	Haskell	Josephine
Pottawatomie	Latimer	Klamath
Roger Mills	Le Flore	Lake
Rogers	Mayes	Lane
Seminole	McCurtain	Lincoln
	McIntosh	Linn
	Muskogee	Marion
	Ottawa	Multnomah
		Polk

Bird

Tillamook
Wasco
Washington
Yamhill
Plover, Western Snowy
Charadrius alexandrinus nivosus

Clatsop
Coos
Curry
Douglas
Lane
Lincoln
Tillamook

Mammal

Deer, Columbian White-tailed
Odocoileus virginianus leucurus
Clatsop
Columbia
Douglas
Multnomah

Pennsylvania**Bird**

Plover, Piping
Charadrius melanotos
Erie

Mammal

Bat, Indiana
Myotis sodalis
Adams
Allegheny
Armstrong
Beaver
Bedford

Berks
Blair
Bradford
Bucks

Butler
Cambria
Cameron
Carbon
Centre
Chester

Mammal

Clarion
Clearfield
Clinton
Columbia
Crawford
Cumberland
Dauphin
Delaware
Elk
Erie
Fayette
Forest
Franklin
Fulton
Greene

Huntingdon
Indiana
Jefferson
Juniata
Lackawanna
Lancaster
Lawrence

Lebanon
Lehigh
Luzerne
Lycoming

Mercer
Mifflin

Monroe
Montgomery
Montour
Northampton
Northumberland
Perry

Pike
Potter
Schuylkill
Snyder

Somerset
Sullivan
Susquehanna
Tioga
Union
Venango

Mammal

Warren
Washington
Wayne
Westmoreland
Wyoming
York
Squirrel, Delmarva Peninsula Fox
Sciurus niger cinereus
Chester

Reptile

Turtle, Bog (Northern population)
Clemmys muhlenbergii

Adams
Berks
Bucks
Bucks
Chester
Cumberland
Franklin
Lancaster
Lebanon
Lehigh
Lehigh
Monroe
Montgomery
Northampton
York

Rhode Island**Bird**

Plover, Piping
Charadrius melanotos
Newport
Washington

Mammal

Bat, Indiana
Myotis sodalis
Providence

South Carolina**Amphibian**

Salamander, Flatwoods
Ambystoma cingulatum
Beaufort
Berkeley
Charleston

Amphibian

Jasper
Orangeburg

Bird

Plover, Piping
Charadrius melanotos
Beaufort
Charleston
Colleton
Georgetown
Horry
Jasper

Stork, Wood

Mycteria americana
Aiken
Allendale
Bamberg
Barnwell
Beaufort
Berkeley
Charleston
Colleton
Dorchester
Georgetown
Hampton

Horry
Jasper
Lexington
Marion
Williamsburg

Warbler, Bachman's
Vermivora bachmanii
Charleston

Woodpecker, Red-cockaded
Picoides borealis
Aiken
Allendale
Bamberg
Barnwell
Beaufort
Berkeley
Calhoun
Charleston
Chesterfield
Clarendon

Bird

Colleton
Darlington
Dillon
Dorchester
Edgefield
Florence
Georgetown
Hampton
Horry
Jasper
Kershaw
Laurens

Lee
Lexington
Marion
Marlboro
McCormick
Orangeburg
Pickens
Richland
Saluda
Sumter
Williamsburg

Mammal

Bat, Indiana
Myotis sodalis

Oconee

Reptile

Sea turtle, green

Chelonia mydas
Charleston
Colleton

Georgetown
Horry
Jasper
Sea turtle, Kemp's ridley
Lepidochelys kempii
Beaufort
Charleston
Colleton
Georgetown
Horry
Jasper

Reptile

Sea turtle, leatherback
Dermochelys coriacea

Beaufort
Charleston
Colleton
Georgetown
Horry
Jasper

Sea turtle, loggerhead
Caretta caretta

Beaufort
Berkeley
Berkeley

Charleston
Colleton
Georgetown
Horry
Jasper

Snake, Eastern Indigo
Drymarchon corais couperi
Hampton
Jasper

South Dakota

Bird

Crane, Whooping
Grus americana

Aurora
Beadle
Bennett
Brule

Buffalo
Butte
Campbell

Charles Mix
Clark
Codington
Corson
Dewey
Douglas
Edmunds
Faulk
Gregory
Haakon
Hand

<u>Bird</u>	<u>Bird</u>	<u>Bird</u>
Hughes	Charles Mix	Shelby
Hyde	Clay	Tern, Interior (population) Least
Jackson	Corson	<i>Stema antillarum</i>
Jerauld	Day	Dyer
Jones	Dewey	Lake
Lawrence	Gregory	Lauderdale
Lyman	Haakon	Shelby
Marshall	Hughes	Tipton
Meade	Meade	Woodpecker, Red-cockaded
Mellette	Pennington	<i>Picoides borealis</i>
Pennington	Potter	Blount
Perkins	Stanley	Campbell
Potter	Sully	Chester
Shannon	Union	Cumberland
Stanley	Walworth	Fentress
Sully	Yankton	Grundy
Tripp	Ziebach	Hardeman
Walworth		Hardin
Ziebach		Knox
Plover, Piping		Macon
<i>Charadrius melanotos</i>		McMinn
Bon Homme	Butte	McNairy
Brule	Corson	Morgan
Buffalo	Custer	Pickett
Campbell	Dewey	Polk
Charles Mix	Fall River	Roane
Clay	Haakon	Scott
Corson	Harding	Sevier
Day	Jackson	Stewart
Dewey	Jones	
Gregory	Lawrence	<u>Mammal</u>
Hughes	Lyman	Bat, Gray
Kingsbury	Meade	<i>Myotis grisescens</i>
Lyman	Mellette	Anderson
Potter	Pennington	Bedford
Stanley	Perkins	Benton
Sully	Shannon	Bledsoe
Union	Stanley	Campbell
Walworth	Todd	Cannon
Yankton	Tripp	Cheatham
		Claiborne
		Claiborne
Tern, Interior (population) Least		Clay
<i>Stema antillarum</i>		Cocke
Bon Homme		De Kalb
Campbell		Decatur

Mammal

Fentress
 Franklin
 Grainger
 Greene
 Grundy
 Hancock
 Hardeman
 Hardin
 Hawkins
 Hickman
 Houston
 Jackson
 Jefferson
 Knox
 Lawrence
 Lincoln
 Marion
 Maury
 Meigs
 Montgomery
 Moore
 Overton
 Perry
 Putnam
 Rhea
 Roane
 Robertson
 Rutherford
 Sequatchie
 Smith
 Stewart
 Sullivan
 Sumner
 Union
 Warren
 Wayne
 White
 Wilson
 Bat, Indiana
Myotis sodalis
 Anderson
 Bedford
 Benton
 Bledsoe

Mammal

Blount
 Bradley
 Campbell
 Cannon
 Carroll
 Carter
 Cheatham
 Chester
 Claiborne
 Clay
 Cocke
 Coffee
 Crockett
 Cumberland
 Davidson
 De Kalb
 Decatur
 Dickson
 Dyer
 Fayette
 Fentress
 Franklin
 Gibson
 Giles
 Grainger
 Greene
 Grundy
 Hamblen
 Hamilton
 Hancock
 Hardeman
 Hardin
 Hawkins
 Haywood
 Henderson
 Henry
 Hickman
 Houston
 Humphreys
 Jackson
 Jefferson
 Johnson
 Knox
 Lake

Mammal

Lauderdale
 Lawrence
 Lewis
 Lincoln
 Loudon
 Macon
 Madison
 Marion
 Marshall
 Maury
 Meigs
 Monroe
 Montgomery
 Moore
 Morgan
 Obion
 Overton
 Perry
 Pickett
 Polk
 Putnam
 Rhea
 Roane
 Robertson
 Rutherford
 Scott
 Sequatchie
 Sevier
 Shelby
 Smith
 Stewart
 Sullivan
 Sumner
 Tipton
 Trousdale
 Unicoi
 Union
 Van Buren
 Warren
 Washington
 Wayne
 Weakley
 White
 Williamson

Mammal

Wilson
 Squirrel, Carolina Northern Flying
Glaucomys sabrinus coloratus
 Blount
 Carter
 Sevier

Texas**Amphibian**

Salamander, Barton Springs
Eurycea sosorum
 Hays
 Travis
 Salamander, San Marcos
Eurycea nana
 Bexar
 Comal
 Hays
 Medina
 Uvalde
 Salamander, Texas Blind
Typhlomolge rathbuni
 Bexar
 Comal
 Hays
 Medina
 Uvalde

Toad, Houston
Bufo houstonensis
 Austin
 Bastrop
 Burleson
 Colorado
 Fort Bend
 Freestone
 Harris
 Harrison
 Lavaca
 Lee
 Leon
 Milam
 Robertson

Bird**Bird**

Crane, Whooping
Grus americana
 Angelina
 Archer
 Armstrong
 Austin
 Bastrop
 Bee
 Bell
 Bexar
 Blanco
 Bosque
 Brazoria
 Brazos
 Brewster
 Brown
 Burleson
 Burnet
 Caldwell
 Calhoun
 Callahan
 Carson
 Clay
 Coleman
 Collin
 Collingsworth
 Colorado
 Comanche
 Cooke
 Coryell
 De Witt
 Denton
 Donley
 Eastland
 Ellis
 Erath
 Falls
 Fayette
 Fort Bend
 Gillespie
 Goliad
 Gonzales
 Gray
 Guadalupe

Bird

Hamilton
 Hardeman
 Harrison
 Haskell
 Hays
 Hill
 Hood
 Howard
 Jack
 Jackson
 Johnson
 Karnes
 Lamar
 Lampasas
 Lavaca
 Lee
 Limestone
 Lipscomb
 Llano
 Lubbock
 Lynn
 Mason
 Matagorda
 Maverick
 Midland
 Milam
 Mills
 Montague
 Ochiltree
 Palo Pinto
 Parker
 Potter
 Randall
 Refugio
 Robertson
 San Patricio
 San Saba
 Somervell
 Tarrant
 Terry
 Travis
 Victoria
 Washington
 Wharton

<u>Bird</u>	<u>Bird</u>	<u>Bird</u>
Wheeler	Jeff Davis	Delta
Wichita	Presidio	Denton
Wilbarger	Owl, Mexican Spotted	Donley
Williamson	<i>Strix occidentalis lucida</i>	El Paso
Wilson	Culberson	Fannin
Wise	El Paso	Freestone
Young	Hudspeth	Gray
Curlew, Eskimo	Jeff Davis	Grayson
<i>Numenius borealis</i>	Plover, Piping	Gregg
Chambers	<i>Charadrius melanotos</i>	Hardeman
Galveston	Angelina	Hemphill
Kleberg	Brazoria	Hutchinson
Willacy	Calhoun	Jeff Davis
Falcon, Northern Aplomado	Cameron	Lamar
<i>Falco femoralis septentrionalis</i>	Chambers	Leon
Brewster	Dallas	Limestone
Brooks	Delta	Milam
Cameron	Denton	Montague
Culberson	Galveston	Rains
Dimmit	Grayson	Randall
Ector	Jefferson	Red River
El Paso	Kleberg	Roberts
Frio	Matagorda	Robertson
Hidalgo	Nueces	Tarrant
Hudspeth	Refugio	Tom Green
Jeff Davis	San Patricio	Val Verde
Kleberg	Tarrant	Webb
Maverick	Willacy	Wheeler
Midland	Prairie-chicken, Attwater's Greater	Wichita
Nueces	<i>Tympanuchus cupido attwateri</i>	Wilbarger
Pecos	Austin	Zapata
Presidio	Colorado	Vireo, Black-capped
Reeves	Galveston	<i>Vireo atricapilla</i>
San Patricio	Goliad	Bandera
Val Verde	Refugio	Bell
Webb	Victoria	Bexar
Willacy	Washington	Blanco
Zapata	Tern, Interior (population) Least	Bosque
Flycatcher, Southwestern Willow	<i>Sterna antillarum</i>	Brewster
<i>Empidonax traillii extimus</i>	Bowie	Brown
Brewster	Clay	Burnet
Culberson	Collingsworth	Callahan
El Paso	Cooke	Coleman
Hudspeth	Dallas	Comal

Bird

Comanche
Concho
Cooke
Coryell
Dallas
Eastland
Edwards
Erath
Gillespie
Grayson
Hamilton
Hays
Hill
Hood
Jack
Jeff Davis
Johnson
Kendall
Kerr
Lampasas
Llano
Maverick
McCulloch
McLennan
Medina
Menard
Midland
Mills
Montague
Nolan
Palo Pinto
Parker
Pecos
Real
Runnels
San Saba
Somervell
Sutton
Taylor
Tom Green
Travis
Uvalde
Val Verde
Williamson

Bird

Wise
Warbler (=Wood), Golden-cheeked
Dendroica chrysoparia
Bandera
Bell
Bexar
Blanco
Bosque
Burnet
Comal
Comanche
Coryell
Dallas
Eastland
Edwards
Erath
Gillespie
Hamilton
Hays
Hill
Hood
Johnson
Kendall
Kerr
Lampasas
Llano
Mason
McLennan
Medina
Menard
Palo Pinto
Real
San Saba
Somervell
Travis
Uvalde
Williamson
Young
Woodpecker, Red-cockaded
Picoides borealis
Anderson
Angelina
Bowie
Cass
Coryell
Dallas
Eastland
Edwards
Erath
Gillespie
Hamilton
Hays
Hill
Hood
Johnson
Kendall
Kerr
Lampasas
Llano
Mason
McLennan
Medina
Menard
Palo Pinto
Real
San Saba
Somervell
Travis
Uvalde
Williamson
Young
Woodpecker, Red-cockaded
Picoides borealis
Anderson
Angelina
Bowie
Cass

Bird

Cherokee
Hardin
Harrison
Hood
Houston
Jasper
Liberty
Marion
Montgomery
Nacogdoches
Newton
Panola
Polk
Red River
Sabine
San Augustine
San Jacinto
Shelby
Trinity
Tyler
Walker

Mammal

Bat, Mexican Long-nosed
Leptonycteris nivalis
Brewster
Presidio
Bear, Louisiana Black
Ursus americanus luteolus
Anderson
Angelina
Bowie
Burleson
Cass
Cherokee
Delta
Fannin
Gregg
Harrison
Jasper
Lamar
Lavaca
Leon
Marion
Morris

<u>Mammal</u>	<u>Mammal</u>	<u>Reptile</u>
Nacogdoches	Live Oak	Brazoria
Newton	Nueces	Calhoun
Panola	San Patricio	Cameron
Refugio	Willacy	Chambers
Robertson	Zapata	Galveston
Rusk	Ocelot	Jefferson
Sabine	<i>Leopardus (=Felis) pardalis</i>	Kleberg
San Augustine	Atascosa	Matagorda
Shelby	Bee	Nueces
Smith	Brooks	Refugio
Upshur	Cameron	San Patricio
Victoria	Dimmit	Willacy
Washington	Duval	Sea turtle, Kemp's ridley
Jaguarundi, Gulf Coast	Frio	<i>Lepidochelys kempii</i>
<i>Herpailurus (=Felis) yagouaroundi cacomitli</i>	Hidalgo	Brazoria
Atascosa	Jim Wells	Calhoun
Bee	Karnes	Cameron
Brooks	Kleberg	Chambers
Cameron	La Salle	Galveston
Dimmit	Live Oak	Jefferson
Duval	Maverick	Kleberg
Frio	Nueces	Matagorda
Hidalgo	Refugio	Nueces
Jim Wells	San Patricio	Refugio
Karnes	Webb	San Patricio
Kleberg	Willacy	Willacy
La Salle	Zapata	Sea turtle, leatherback
Live Oak	Zavala	<i>Dermochelys coriacea</i>
Maverick		Brazoria
Nueces		Calhoun
Refugio		Calhoun
San Patricio		Cameron
Webb		Chambers
Willacy		Chambers
Zapata		Galveston
Zavala		Galveston
Jaguarundi, Sinaloan		Jefferson
<i>Herpailurus (=Felis) yagouaroundi tolteca</i>		Jefferson
Brooks		Kleberg
Cameron		Matagorda
Hidalgo		Nueces
Jim Wells		Refugio
Kleberg		San Patricio
		San Patricio
		Willacy
		Sea turtle, loggerhead
		<i>Caretta caretta</i>
		Brazoria
		Calhoun

<u>Reptile</u>	<u>Mammal</u>	<u>Bird</u>
Cameron	Garfield	Woodpecker, Red-cockaded
Chambers	Grand	<i>Picoides borealis</i>
Galveston	San Juan	Southampton
Jefferson	Uintah	Sussex
Kleberg	Prairie Dog, Utah	<u>Mammal</u>
Matagorda	<i>Cynomys parvidens</i>	Bat, Gray
Nueces	Beaver	<i>Myotis grisescens</i>
Refugio	Garfield	Craig
San Patricio	Iron	Lee
Willacy	Piute	Russell
Snake, Concho Water	Sevier	Scott
<i>Nerodia paucimaculata</i>	Washington	Smyth
Brown	Wayne	Tazewell
Coleman	<u>Reptile</u>	Washington
Concho	Tortoise, Desert	Wise
Lampasas	<i>Gopherus agassizii</i>	<u>Bat, Indiana</u>
Maverick	Iron	<i>Myotis sodalis</i>
McCulloch	Washington	Albemarle
Mills		Alleghany
Mitchell	<u>Vermont</u>	Alleghany
Runnels	<u>Mammal</u>	Amherst
San Saba	Bat, Indiana	Augusta
Tom Green	<i>Myotis sodalis</i>	Bath
<u>Utah</u>	Addison	Bedford
<u>Bird</u>	Bennington	Bland
Flycatcher, Southwestern Willow	Chittenden	Botetourt
<i>Empidonax traillii extimus</i>	Rutland	Botetourt
Washington	Windsor	Buchanan
Owl, Mexican Spotted		Craig
<i>Strix occidentalis lucida</i>		Dickenson
Garfield	<u>Virginia</u>	Fauquier
Grand	<u>Amphibian</u>	Floyd
Iron	Salamander, Shenandoah	Frederick
Kane	<i>Plethodon shenandoah</i>	Giles
San Juan	Madison	Grayson
Uintah	Page	Greene
Washington	Rappahannock	Highland
Wayne		Lee
<u>Mammal</u>	<u>Bird</u>	Madison
Ferret, Black-footed	Plover, Piping	Montgomery
<i>Mustela nigripes</i>	<i>Charadrius melanotos</i>	Nelson
Duchesne	Accomack	Page
Emery	Chesapeake	Pulaski
	Northampton	Rappahannock
	York	Roanoke
		Rockbridge

<u>Mammal</u>	<u>Bird</u>	<u>Bird</u>
Rockingham	Murrelet, Marbled <i>Brachyramphus marmoratus</i> <i>marmoratus</i>	Plover, Western Snowy <i>Charadrius alexandrinus nivosus</i>
Russell	Clallam	Grays Harbor
Scott	Cowlitz	Pacific
Shenandoah	Grays Harbor	<u>Mammal</u>
Smyth	Island	
Tazewell		Bear, Grizzly <i>Ursus arctos horribilis</i>
Warren		Chelan
Washington	Jefferson	
Wise	King	King
Wythe	Kitsap	Kittitas
Bat, Virginia Big-eared <i>Corynorhinus (=Plecotus) townsendii</i> <i>virginianus</i>	Kittitas	Lewis
Augusta	Lewis	Okanogan
Bath	Pacific	Pierce
Bland	Pierce	Skagit
Buchanan	Skagit	Snohomish
Craig	Snohomish	Stevens
Giles	Thurston	Whatcom
Highland	Wahkiakum	Yakima
Montgomery	Whatcom	Deer, Columbian White-tailed <i>Odocoileus virginianus leucurus</i>
Pulaski	Owl, Northern Spotted <i>Strix occidentalis caurina</i>	Clark
Rockingham	Chelan	Cowlitz
Russell	Clallam	Pacific
Shenandoah	Clark	Skamania
Smyth	Cowlitz	Wahkiakum
Tazewell	Grays Harbor	Rabbit, Pygmy <i>Brachylagus idahoensis</i>
Squirrel, Delmarva Peninsula Fox <i>Sciurus niger cinereus</i>	Island	Adams
Accomack	Jefferson	Benton
Northampton	King	Douglas
	Kittitas	
	Klickitat	Grant
<u>Reptile</u>	Lewis	Lincoln
Sea turtle, loggerhead <i>Caretta caretta</i>	Mason	
Accomack	Okanogan	<u>West Virginia</u>
Gloucester	Pacific	
	Pierce	<u>Amphibian</u>
		Salamander, Cheat Mountain

Lancaster
Mathews
Middlesex
Northampton
Northumberland
Virginia Beach

York

Washington

Skagit
Skamania
Snohomish
Thurston
Wahkiakum
Whatcom

Yakima

Plethodon nettingi
Pendleton
Pocahontas
Randolph
Tucker

Mammal

Bat, Gray
Myotis grisescens

<u>Mammal</u>	<u>Mammal</u>	<u>Bird</u>
Pendleton	Roane	Waushara
Bat, Indiana	Summers	Winnebago
<i>Myotis sodalis</i>	Taylor	Wood
Barbour	Tucker	Plover, Piping
Berkeley	Tyler	<i>Charadrius melanotos</i>
Boone	Upshur	Ashland
Braxton	Wayne	Douglas
Brooke	Webster	Manitowoc
Cabell	Wetzel	Marinette
Calhoun	Wirt	Warbler (=Wood), Kirtland's
Clay	Wood	<i>Dendroica kirtlandii</i>
Doddridge	Wyoming	Douglas
Fayette	Bat, Virginia Big-eared	Jackson
Gilmer	<i>Corynorhinus (=Plecotus) townsendii virginianus</i>	Marinette
Grant	Grant	Vilas
Greenbrier	Pendleton	Washburn
Hampshire	Tucker	<u>Mammal</u>
Hancock		Lynx, Canada
Hardy	Squirrel, Carolina Northern Flying	<i>Lynx canadensis</i>
Harrison	<i>Glaucomys sabrinus coloratus</i>	Ashland
Jackson	Pocahontas	Bayfield
Jefferson		Burnett
Kanawha		Douglas
Lewis		Florence
Lincoln	Crane, Whooping	Forest
	<i>Grus americana</i>	Iron
Logan	Adams	Iron
Marion	Clark	Marinette
Marshall	Columbia	Marinette
Mason	Crawford	Oneida
Mercer	Dane	Oneida
Mineral	Dodge	Price
Monongalia	Fond Du Lac	Price
Monroe	Green	Sawyer
Morgan	Green Lake	Sawyer
Nicholas	Iowa	Vilas
Ohio	Jackson	Vilas
Pendleton	Jefferson	Washburn
Pleasants	Juneau	Washburn
Pocahontas		<u>Wyoming</u>
		<u>Mammal</u>
		<u>Mammal</u>
		Bear, Grizzly
		Bear, Grizzly
		<i>Ursus arctos horribilis</i>
		Fremont
		Park

Preston	Marathon	Ferret, Black-footed <i>Mustela nigripes</i>
Putnam	Monroe	
Raleigh	Oconto	Big Horn
Randolph	Richland	Campbell
Ritchie	Rock	Converse
	Sauk	

10/25/2010 4:50:10 PM Ver. 2.10.4

Page 44 of 49

Mammal

Crook
Fremont
Goshen
Hot Springs
Johnson
Laramie
Natrona
Park
Platte
Sheridan
Washakie
Weston

Mouse, Preble's Meadow Jumping
Zapus hudsonius preblei

Converse
Laramie
Platte

170 Species Affected:

Inverse Name:

'Akepa, Hawaii
 'Akepa, Maui
 'Akia Loa, Kauai (*Hemignathus procerus*)
 'Akia Pola'au (*Hemignathus munroi*)
 Albatross, Short-tailed
 Bat, Gray
 Bat, Hawaiian Hoary
 Bat, Indiana
 Bat, Lesser (=Sanborn's) Long-nosed
 Bat, Mexican Long-nosed
 Bat, Ozark Big-eared
 Bat, Virginia Big-eared
 Bobwhite, Masked
 Caribou, Woodland
 Condor, California
 Coot, Hawaiian (=Alae keo keo)
 Crane, Mississippi Sandhill
 Crane, Whooping
 Creeper, Hawaii
 Creeper, Molokai (Kakawahie)
 Creeper, Oahu (Alauwahio)
 Crow, Hawaiian ('Alala)
 Curlew, Eskimo
 Deer, Columbian White-tailed
 Duck, Hawaiian (Koloa)
 Duck, Laysan
 Elepaio, Oahu
 Falcon, Northern Aplomado
 Ferret, Black-footed
 Finch, Laysan
 Finch, Nihoa
 Flycatcher, Southwestern Willow
 Fox, San Joaquin Kit
 Fox, San Miguel Island
 Fox, Santa Catalina Island
 Fox, Santa Cruz Island
 Fox, Santa Rosa Island
 Frog, Dusky Gopher (Mississippi DPS)
 Frog, Mountain Yellow-legged
 Goose, Hawaiian (Nene)
 Hawk, Hawaiian (Io)
 Honeycreeper, Crested ('Akohekohe)
 Jaguar
 Jaguarundi, Gulf Coast
 Jaguarundi, Sinaloan
 Kangaroo Rat, Fresno
 Kangaroo Rat, Giant
 Kangaroo Rat, Morro Bay
 Kangaroo Rat, San Bernardino Merriam's
 Kangaroo Rat, Stephens'
 Kangaroo Rat, Tipton
 Kauai creeper
 Kite, Everglade Snail

Taxa:	Co.	Status:
Bird	2	Endangered
Bird	5	Endangered
Bird	3	Endangered
Bird	2	Endangered
Bird	3	Endangered
Mammal	1103	Endangered
Mammal	13	Endangered
Mammal	5223	Endangered
Mammal	36	Endangered
Mammal	9	Endangered
Mammal	29	Endangered
Mammal	146	Endangered
Bird	2	Endangered
Mammal	8	Endangered
Bird	61	Endangered
Bird	13	Endangered
Bird	4	Endangered
Bird	1211	Endangered
Bird	2	Endangered
Bird	5	Endangered
Bird	3	Endangered
Bird	2	Endangered
Bird	15	Endangered
Mammal	46	Endangered
Bird	8	Endangered
Bird	3	Endangered
Bird	3	Endangered
Bird	85	Endangered
Mammal	405	Endangered
Bird	3	Endangered
Bird	3	Endangered
Bird	175	Endangered
Mammal	104	Endangered
Mammal	7	Endangered
Mammal	6	Endangered
Mammal	7	Endangered
Mammal	7	Endangered
Amphibian	5	Endangered
Amphibian	19	Endangered
Bird	10	Endangered
Bird	2	Endangered
Bird	5	Endangered
Mammal	22	Endangered
Mammal	47	Endangered
Mammal	30	Endangered
Mammal	27	Endangered
Mammal	64	Endangered
Mammal	8	Endangered
Mammal	13	Endangered
Mammal	20	Endangered
Mammal	21	Endangered
Bird	3	Endangered
Bird	70	Endangered

Lizard, Blunt-nosed Leopard	Reptile	77	Endangered
Millerbird, Nihoa	Bird	3	Endangered
Moorhen, Hawaiian Common	Bird	11	Endangered
Mountain Beaver, Point Arena	Mammal	9	Endangered
Mouse, Alabama Beach	Mammal	8	Endangered
Mouse, Anastasia Island Beach	Mammal	3	Endangered
Mouse, Choctawhatchee Beach	Mammal	12	Endangered
Mouse, Pacific Pocket	Mammal	18	Endangered
Mouse, Perdido Key Beach	Mammal	13	Endangered
Mouse, Salt Marsh Harvest	Mammal	45	Endangered
Nuku Pu'u	Bird	8	Endangered
Ocelot	Mammal	59	Endangered
'O'o, Kauai (=A'a)	Bird	3	Endangered
'O'u (Honeycreeper)	Bird	5	Endangered
Palila	Bird	2	Endangered
Panther, Florida	Mammal	36	Endangered
Parrotbill, Maui	Bird	5	Endangered
Petrel, Hawaiian Dark-rumped	Bird	10	Endangered
Plover, Piping	Bird	1279	Endangered
Po'ouli	Bird	5	Endangered
Prairie-chicken, Attwater's Greater	Bird	23	Endangered
Pronghorn, Sonoran	Mammal	12	Endangered
Pygmy-owl, Cactus Ferruginous	Bird	28	Endangered
Rabbit, Pygmy	Mammal	31	Endangered
Rabbit, Riparian Brush	Mammal	7	Endangered
Rail, California Clapper	Bird	60	Endangered
Rail, Light-footed Clapper	Bird	32	Endangered
Rail, Yuma Clapper	Bird	38	Endangered
Salamander, Barton Springs	Amphibian	7	Endangered
Salamander, California Tiger	Amphibian	142	Endangered
Salamander, Desert Slender	Amphibian	6	Endangered
Salamander, Santa Cruz Long-toed	Amphibian	13	Endangered
Salamander, Shenandoah	Amphibian	16	Endangered
Salamander, Sonora Tiger	Amphibian	7	Endangered
Salamander, Texas Blind	Amphibian	21	Endangered
Sea turtle, green	Reptile	222	Endangered
Sea turtle, hawksbill	Reptile	108	Endangered
Sea turtle, Kemp's ridley	Reptile	125	Endangered
Sea turtle, leatherback	Reptile	216	Endangered
Sheep, Peninsular Bighorn	Mammal	20	Endangered
Sheep, Sierra Nevada Bighorn	Mammal	10	Endangered
Shrew, Buena Vista Lake Ornate	Mammal	8	Endangered
Shrike, San Clemente Loggerhead	Bird	6	Endangered
Snake, San Francisco Garter	Reptile	11	Endangered
Sparrow, Cape Sable Seaside	Bird	9	Endangered
Sparrow, Florida Grasshopper	Bird	23	Endangered
Squirrel, Carolina Northern Flying	Mammal	85	Endangered
Squirrel, Delmarva Peninsula Fox	Mammal	72	Endangered
Squirrel, Mount Graham Red	Mammal	3	Endangered
Stilt, Hawaiian (=Ae'o)	Bird	13	Endangered
Stork, Wood	Bird	744	Endangered
Tern, California Least	Bird	69	Endangered
Tern, Interior (population) Least	Bird	910	Endangered
Tern, Roseate	Bird	67	Endangered
Thrush, Large Kauai	Bird	3	Endangered
Thrush, Molokai (Oloma'o)	Bird	5	Endangered
Thrush, Small Kauai (Puaiohi)	Bird	3	Endangered

Toad, Arroyo Southwestern	Amphibian	56	Endangered
Toad, Houston	Amphibian	53	Endangered
Turtle, Alabama Red-bellied	Reptile	14	Endangered
Turtle, Plymouth Red-bellied	Reptile	7	Endangered
Vireo, Black-capped	Bird	193	Endangered
Vireo, Least Bell's	Bird	69	Endangered
Vole, Amargosa	Mammal	8	Endangered
Vole, Florida Salt Marsh	Mammal	5	Endangered
Vole, Hualapai Mexican	Mammal	5	Endangered
Warbler (=Wood), Golden-cheeked	Bird	111	Endangered
Warbler (=Wood), Kirtland's	Bird	158	Endangered
Warbler, Bachman's	Bird	22	Endangered
Woodpecker, Ivory-billed	Bird	18	Endangered
Woodpecker, Red-cockaded	Bird	1765	Endangered
Woodrat, Riparian	Mammal	7	Endangered
Bear, Grizzly	Mammal	146	Threatened
Bear, Louisiana Black	Mammal	326	Threatened
Caracara, Audubon's Crested	Bird	50	Threatened
Crocodile, American	Reptile	15	Threatened
Eagle, Bald	Bird	26	Threatened
Frog, California Red-legged	Amphibian	138	Threatened
Frog, Chiricahua Leopard	Amphibian	45	Threatened
Gnatcatcher, Coastal California	Bird	38	Threatened
Lizard, Coachella Valley Fringe-toed	Reptile	6	Threatened
Lizard, Island Night	Reptile	20	Threatened
Lynx, Canada	Mammal	193	Threatened
Mouse, Preble's Meadow Jumping	Mammal	37	Threatened
Mouse, Southeastern Beach	Mammal	6	Threatened
Murrelet, Marbled	Bird	229	Threatened
Owl, Mexican Spotted	Bird	181	Threatened
Owl, Northern Spotted	Bird	328	Threatened
Plover, Western Snowy	Bird	144	Threatened
Prairie Dog, Utah	Mammal	18	Threatened
Rattlesnake, New Mexican Ridge-nosed	Reptile	9	Threatened
Salamander, Cheat Mountain	Amphibian	20	Threatened
Salamander, Flatwoods	Amphibian	127	Threatened
Salamander, Red Hills	Amphibian	25	Threatened
Salamander, San Marcos	Amphibian	21	Threatened
Scrub-Jay, Florida	Bird	129	Threatened
Sea turtle, loggerhead	Reptile	361	Threatened
Sea turtle, olive ridley	Reptile	30	Threatened
Shearwater, Newell's Townsend's	Bird	8	Threatened
Skink, Blue-tailed Mole	Reptile	13	Threatened
Skink, Sand	Reptile	27	Threatened
Snake, Atlantic Salt Marsh	Reptile	10	Threatened
Snake, Concho Water	Reptile	25	Threatened
Snake, Eastern Indigo	Reptile	655	Threatened
Snake, Giant Garter	Reptile	62	Threatened
Snake, Lake Erie Water	Reptile	14	Threatened
Snake, Northern Copperbelly Water	Reptile	72	Threatened
Sparrow, San Clemente Sage	Bird	6	Threatened
Squirrel, Northern Idaho Ground	Mammal	2	Threatened
Tortoise, Desert	Reptile	52	Threatened
Tortoise, Gopher	Reptile	93	Threatened
Towhee, Inyo Brown	Bird	1	Threatened
Turtle, Bog (Northern population)	Reptile	226	Threatened
Turtle, Flattened Musk	Reptile	45	Threatened

Turtle, Ringed Sawback	Reptile	59	Threatened
Turtle, Yellow-blotched Map	Reptile	37	Threatened
Whipsnake (=Striped Racer), Alameda	Reptile	10	Threatened

No species were selected for exclusion.

Dispersed species included in report.